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Software to the rescue

- Managing mergers
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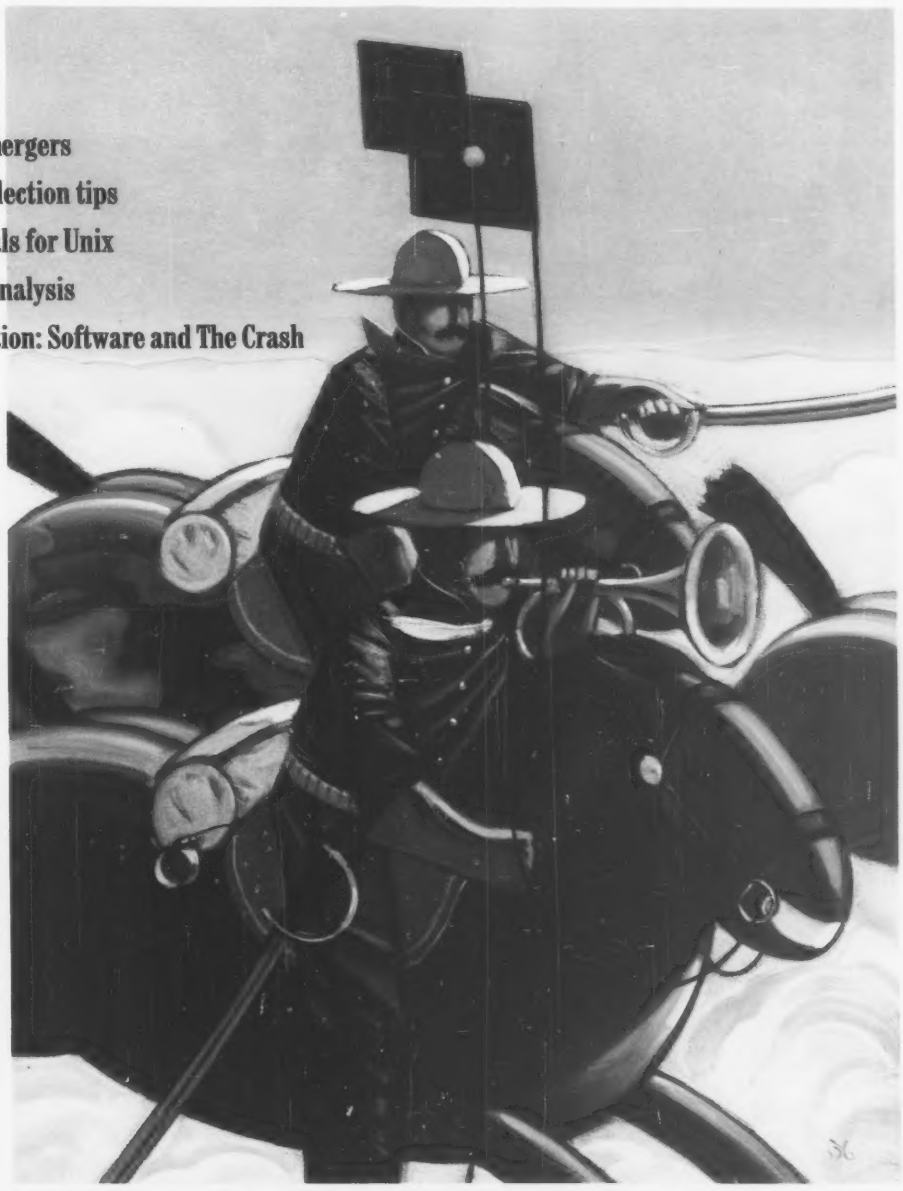

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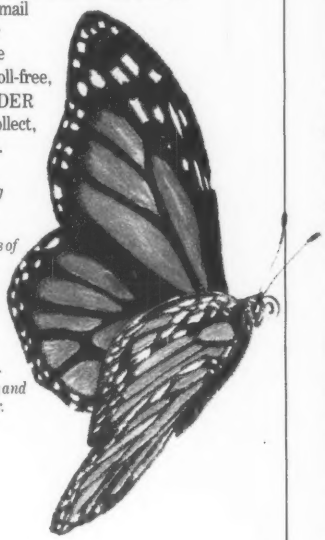

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in focus

FOR BETTER, FOR WORSE

Your company just acquired a hot little widget firm, and the big boss expects smooth operations immediately. But you've got incompatible systems. You've got incompatible cultures. You've got a mess on your hands. In this decade of heightened merger and acquisition activity, this scenario is not uncommon. Our reporter talks to merger partners to see how they are blending systems and style without missing a beat in business. By Michael Ball. *Page 12.*

A PORT TO SAA

Goodbye Silverlake, hello AS/400. Now that the mid-range product has emerged from code-name limbo and taken its place in IBM's SAA strategy, what can the industry expect? The action is fast and furious. Software developers are in the middle of a massive applications effort, while MIS professionals are claiming that the system is difficult to configure. There is no lack of opinion on what AS/400 means; see if you agree. By Helen Pike. *Page 31.*

Cost of choosing software

By Leland G. Freeman. There was nothing like the good old days of software selection. No expense was spared to get the right tool; the word "budget" didn't exist. Then the economy soured. Spending cutbacks and stricter guidelines have all but put an end to those carefree times. With top management scrutinizing purchasing, MIS is under pressure to deliver or else. Read about the exciting areas to watch that can make you a software selection star. *Page 17.*

Mixed signals for Unix

By Michael Tucker. The Unix market is coming into its own. Unix-based products and partnerships are emerging at a fast rate and commercial acceptance seems assured. All the elements are there to catapult it to success — except one. Unix has no clear leader to take control, set standards and champion the technology. OSF, AT&T and Sun and a myriad of other vendors are vying for that role but have so far only succeeded in confusing users. This article examines the state of the Unix market today. *Page 27.*

COVER BY BART GOLDMAN

SPECIAL SECTION

Software and The Crash

Who's to blame for October's stock market fiasco? It was the economy's fault. It was the traders' fault. It was the systems' fault. No amount of finger pointing, however, is going to change the obvious: We live in a time when information is vital to our economic health. Writers Stan Kolodziej and Helen Pike explore the technological challenge facing the postcrash financial services industry. Page 19.

From the Editor

Including your letters to us. *Page 5.*

News & Analysis

Litigation craze hits the software industry; the OSF challenge to Sun and AT&T; 1-2-3/M delays fuel speculation about problems at Lotus; AT&T's Kavner fights CFO stereotype. *Page 6.*

Manager's Corner

Jim Young waxes nostalgic on the simpler days of DBMS software. *Page 11.*

Products

Tech Talk on consortia formed to share the software development burden; CASE-based reengineering line; text management tool using AI and object-oriented programming. *Page 33.*

Blue Beat

Brian Jeffery on whether SAA is a ruse or news. *Page 33.*

Calendar

Industry events. *Page 39.*

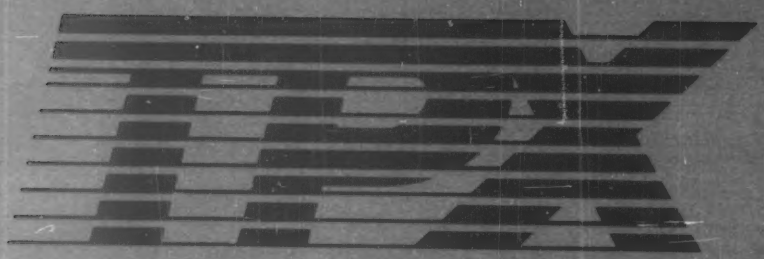
The Insider

Michael Millikin on the significance of the IBM and Metaphor Computer alliance. *Page 40.*

Log Off

The historical growth in mergers and acquisitions in the software industry. *Page 40.*

The reasons may vary, but the choice is the same.



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FROM THE EDITOR

Pushed to the limit

It's a vicious cycle. The demand for information is pushing software up to and beyond its limits. Meanwhile, advancements in software and accompanying hardware performance and memory capacity have worked to create a seemingly unquenchable thirst for information. In fact, technology's progress has changed the very nature of what we expect from our banks, airlines, manufacturers and utilities. What company does not have data and information technology as its lifeline? What's more, this data dependence is no longer found solely in big organizations; the size of companies that depend on technology is increasingly smaller.

As our expectations are raised by the capabilities and power of a set of technologies, companies are maneuvering to get ahead of their competition and calling for technology to lead, not just follow. By placing greater demand in terms of performance, volume and functions on the service or information being offered, can we realistically expect technology to grow at the same or at a faster pace? Is the demand out of control?

Nothing could have brought this point home to us more dramatically than when our pocketbooks were hit by the Oct. 19 stock market crash. This culmination of a series of events revealed to us the role technology and information has come to play in everyday life. This month's Special Section, written by Helen Pike and Stan Kolodziej, analyzes from a technology, as well as economic, point of view what lead up to and happened during the crash. More importantly, these *Focus* writers delve into the technological steps being taken to avoid a repeat of Black Monday. Their interviews with top traders and technical experts reveal the frightening thought that the crash may actually have been a microcosm of what could happen at a more rapid rate in the Information Age.

BUT IT'S NOT JUST SOFTWARE that is being pushed to its limits. MIS managers are also being asked to do the seemingly impossible. With the increase in company mergers, buy-outs and takeovers, MIS must tackle the difficult (and often unpopular) task of smoothly merging departments, operations, staff and cultures. A feature this month examines the hazards of managing mergers. According to MIS insiders, control is the key issue, and the article shows how to protect your piece of the pie.

Ann Dooley

Early work set the standards for today's data bases, 4GLs

LETTERS TO THE EDITOR

The letter from Donald D. Irvin in the June issue of *Computerworld Focus* asks about data base systems and fourth-generation languages of truly ancient stature.

Because it is a bit hard to define a fourth-generation language, I can only suggest there were languages that generated code long before 1963. One that I recall was developed at General Motors Research Laboratories in the 1950s to solve spring-balance problems. Dyana, an acronym for Dynamics Analyzer Programmer, was so early that the original work generated assembly language but the "released" version generated Fortran statements.

One of the interesting fourth-generation language-like characteristics of Dyana was its nonprocedural nature.

Dyana was developed by Joe Olsztyn, Ted Theodoroff, Barrett Hargreaves and Howard McKenna under the direction of Edwin L. Jacks.

As for older data base systems, I would suggest two of which I am aware.

The work done by Charlie Bachman at General Electric Co. in the early 1960s led to what I would consider a working data base system during the time Mr. Irvine discusses. As best as I can recall, Bachman's work was implemented first on the GE 225 machine and was called IDS. I believe it was later transliterated and reemerged under other names on other machines.

The second example is from the General Motors Research Laboratories and is described more fully in papers presented at the 1964 Fall Joint Computer Conference. In the process of building the first useful graphics systems for automotive body design, what is clearly recognizable as a data base system was developed. The work on the disk system was done by the late Phyllis Cole, Dick Lewis and myself under the direction of Mr. Jacks.

I am sure there were other examples around at the same time, but I personally don't know of anything any earlier than the work of Bachman.

Philip H. Dorn
President
Dorn Computer Consultants, Inc.
New York

AS/400 EDITORIAL COMMENTARY

Faint strains of DEC's design weave through IBM's new opus

Has IBM borrowed a few bars from DEC's design notations?

You might think so by listening to the marketing melody that accompanied the debut of the AS/400 family of products when it bowed before the press on June 21 in New York City.

Digital's theme is a score of ease of use, of adaptability, of a growth path, of a common architecture, of connectivity. If users want more, all they have to do is add another computing instrument to the ensemble and string it together on the network.

With the rollout of the AS/400, it's almost like audio deja vu. Cup your ear and you might hear the strains of a familiar theme. Big Blue's orchestra is playing variations on modularity, consistency, simplicity, an integrated operating system, partnership, on-line education and support and, in its coda, ease of use and connectivity.

How many of us can sing the chorus as we wait for the reviews to come in on the AS/400's plug-and-play capability?

news & analysis

UPDATE

Developers for hire

Even in a supposedly booming software industry, there are still layoffs. Witness the painful retrenchment of Cullinet Software, Inc. in Westwood, Mass. The company gave 400 employees pink slips in a single day in May, including programmers who were considered crucial to the company's turnaround efforts. As one former employee put it, "We got down to the one-yard line, but we weren't allowed to carry the ball over the goal line."

But there was at least one more move in the playbook for ousted employees.

"When the smoke settles, people will probably wind up in a better position," observes Fred Gaffner, the company's former senior product manager for its computer-integrated manufacturing line. "Cullinet has a good record of hiring good people."

Even so, Gaffner, 51, describes himself as "being pretty shocked" when he was given 10 minutes' notice that his job was being eliminated. "I'm taking early retirement for the second time — only this one I didn't plan for," wryly observes the 30-year IBM veteran, who opted to participate in IBM's early retirement program a few years ago.

Gaffner, along with his Cullinet colleagues, however, found a silver lining in the gray cloud of rejection, this one in the form of an outplacement service their former employer set up.

"The center is a catalyst, a focal point to share problems and offer encouragement," Gaffner says. It also is the hub for job interviews and recruitment. Calls have been coming in for program and systems analysts to consultants to chief executives.

"If a programmer is unemployed for more than two days, it means he shouldn't be in programming," Gaffner says. "With the data processing proliferation, the need for applications has no end. MIS has to solve some of the world's problems."

IBM seeks entre into software society's poshest groups

Like one seeking membership in the right country club and charity foundation, IBM is signing up for all the excrutiatingly correct nonpartisan software-related ventures. So it was a busy spring season for the software debutante. May, in particular, saw the Big Blue deb join the Network Computing Forum, sponsored by Apollo Computer, Inc., the Corporation for Open Systems and the Open Software Foundation, to which the Armonk, N.Y.-headquartered company is donating features from its proprietary Unix operating system, AIX, to help forge a new Unix alternative.

Keep the membership forms handy.

Sun figures show firm not affected by Unix brouhaha

Suffering no immediate ill effects from the alternative Unix brouhaha, Sun Microsystems, Inc. in Mountain View, Calif., rolls merrily along, plowing nearly half its quarterly research and development budget into software development.

In the quarter that closed June 3, the workstation maker spent an estimated $20 million, up from $18 million in the third quarter and still more than the $15 million spent in the second quarter.

To further bolster its financial footing, the company issued common stock valued at $40.6 million to partner AT&T. According to Austin Mayer, Sun's investor relations director, the cash will be used for "normal expenditures: receivables and inventories." Some of the funds will be used for manufacturing and warehouse expansion in Milpitas, Calif., he adds.

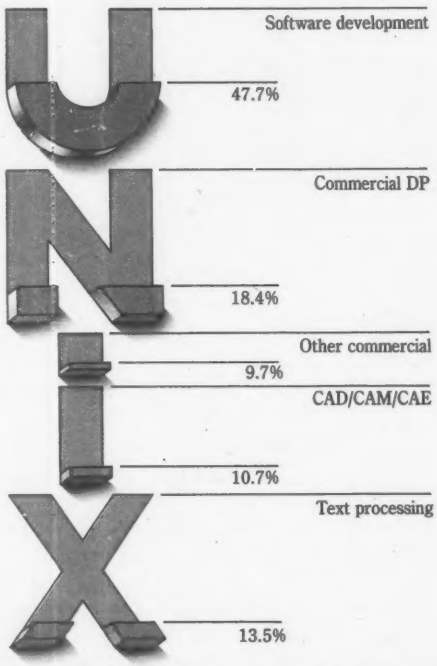
Says Robert Herwick, an analyst with venture capital firm Hambrecht & Quist, Inc. in New York, Sun has a 10% pretax operating margin that "means it's spending money on development and marketing. Therefore, there's not as much profit."

The rapidly growing company still has large working capital requirements, Herwick explains. In a time of uncertain capital markets and change at AT&T, it is "an important point for [Sun] to make that AT&T will honor the agreement," he adds, referring to a Sun-AT&T deal announced Jan. 6. Under

Continued on page 8

Unix uses

Distribution of primary Unix applications



INFORMATION GATHERED FROM A 1987 SURVEY OF 103 UNIX SITES BY INTERNATIONAL DATA CORP.

GRAPHIC BY BRUCE SANDERS

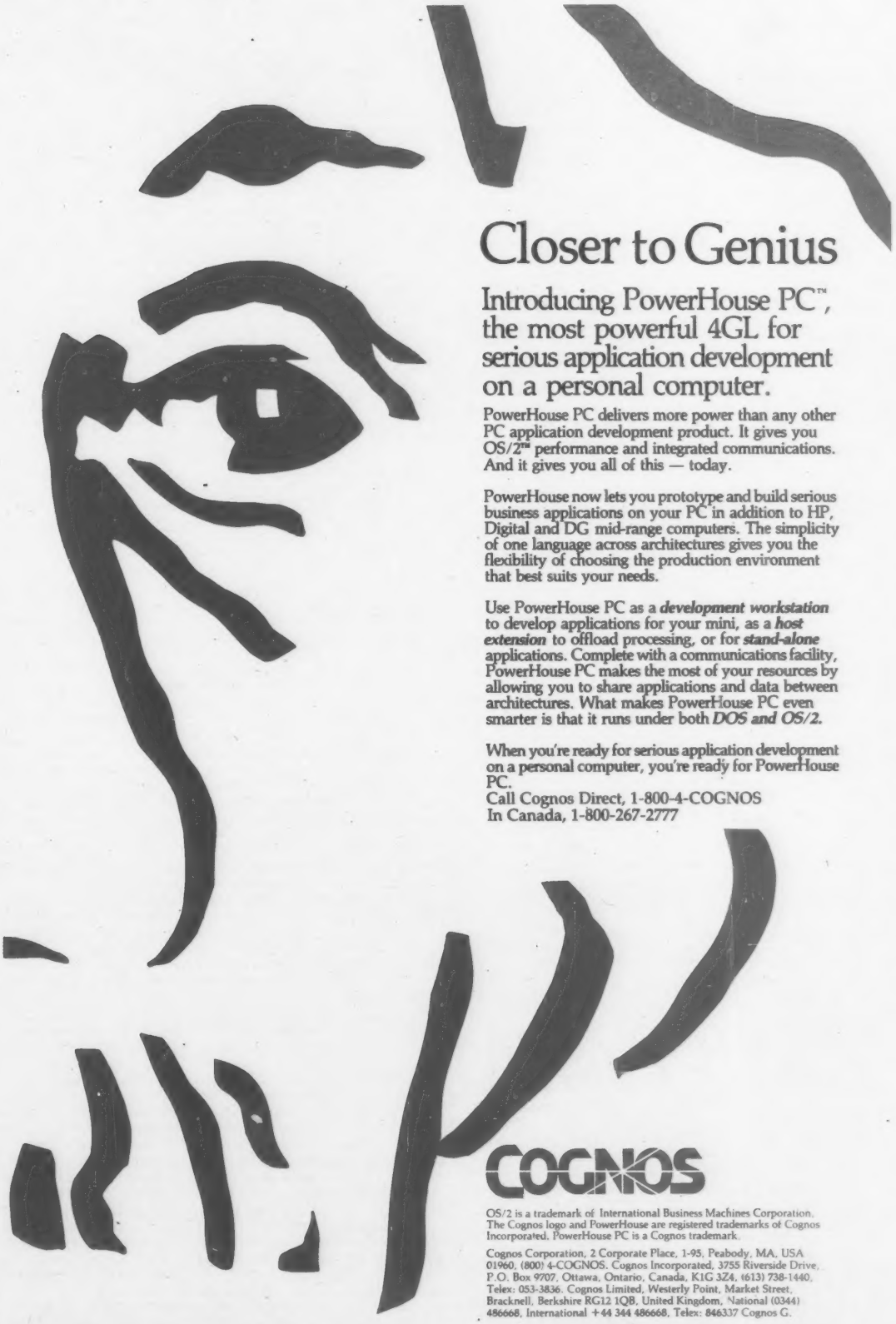
Trying times: Lawsuits threaten developers

A litigation craze has hit the software business. Suddenly, software developers are finding themselves at risk in copyright disputes. For some of the smaller developers that can least afford legal fees, this new age offers both perils and promise.

Until recently, copyright laws were rarely invoked in the software industry. However, in the last year and a half, major lawsuits have been launched by some of the biggest computer firms in the business. Lotus Development Corp. led off the assault in 1987 with suits directed against makers of clone products that closely mimicked its 1-2-3 spreadsheet. In more recent months, Apple Computer, Inc. began a suit aimed at protecting the interface of its Macintosh.

How will these suits affect software developers? "The Lotus suit doesn't seem to be having much effect at all," says Richard M. Lucash, a partner with the Boston-based law firm of Lucash, Gesmer and Updegrove, which specializes in computer law. "With very few exceptions, there just weren't that many people out there making exact duplications of other people's software products. I know of maybe one product, a

Continued on page 9



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Circle Reader Service Number 4

Update

Continued from page 6

the terms of the agreement, AT&T could acquire approximately 20% of Sun and the two companies would cooperate on a common version of Unix.

Sun, like many of its competitors, is also facing mounting constraints on the availability of dynamic random-access memory chips made by the Japanese, Herwick says. This scarcity will affect Sun-4 models and the newly released Sun386I workstations, he says.

Report finds that the use of programming utilities on the rise

By 1994, programming utilities will account for 30.2% of the systems software market, while operating systems software will come to 34.6%, and programming languages will hold a stable share of 35.1%, according to a recently released report from Market Intelligence Research Co. in Mountain View, Calif. In 1984, operating systems software had 57.4% of the overall market.

Symbolics move: AI firm inks deal to resell Sony Unix workstations

What do you get when you cross the artificial intelligence community's most promising yet financially beleagured company with a budding Japanese maker of Unix-based workstations?

For now, a resellers' agreement.

Symbolics, Inc. in Cambridge, Mass., has signed a deal with Palo Alto, Calif.-based Sony Microsystems Co., a 9-month-old division of Sony Corporation of America, which is, in turn, a subsidiary of the $10.2 billion Sony Corp. in Tokyo. Under the agreement, Symbolics will act as a reseller for Sony's News family of Unix technical workstations. Sony began making and shipping its News workstations from San Diego in April.

Symbolics will incorporate the News-711 and News-841 workstations into its product family. Customers will be able to connect News and Symbolics systems in a network using multiple News as network stations to access Symbolics' knowledge server.

Symbolics, with 20 sales and service centers worldwide, is expected to OEM and handle third-party service for the Sony machine. The company will also have the option of reselling Sony's newest workstations that are based on Motorola, Inc.'s 68030 microprocessor, running at 25 MHz.

And for later?

Future generations of the Unix-based workstations are expected to carry Symbolics' Ivory single-chip symbolic processor.

Symbolics also plans to provide a version of its Common Lisp Operating Environment (CLOE) layered software package for use with Sony's desktop computers. With CLOE, AI applications developed on Symbolics systems do not have to be recompiled for News.

Apple acquires Orion to push Mac further into IBM territory

Apple Computer, Inc. is pushing its Macintosh line further into IBM's domain with the acquisition of Berkeley, Calif.-based Orion Network Systems, Inc., the company that helped Apple develop the MacAPPC SNA protocol earlier this year.

Orion makes IBM-compatible Systems Network Architecture (SNA) software that allows non-IBM processors to communicate over networks with IBM processors. MacAPPC is a software implementation of two key SNA protocols, LU6.2 and PU2.1. — HELEN PIKE

dB
By Rich Tennant
HAVE WE GOT A VIRUS OR WHAT?
HOW BAD IS IT?
WELL, IT'S INFECTING EVERYTHING AROUND IT. FIRST IT GOT INTO THE PRINTER, WHICH IS NOW RUNNING OUT REAMS OF OLD WALTER MONDALE SPEECHES, AND NOW IT'S IN MY TELEPHONE.
I KEEP GETTING THE SAME RECORDING REGARDLESS OF WHAT NUMBER I DIAL.
"HI! THIS IS JIM AND TAMMY FAYE. THANKS FOR CALLING. YOU KNOW, IN THE LAST FEW MONTHS, TAMMY'S SINGING CAREER HAS REALLY TAKEN OFF. SING SOMETHING FOR US TAMMY."
"OH, JIM..."
THIS IS SICK.

New kid on the Unix block challenges Sun, AT&T control

Remember the children's game: "Button, button, who's got the button?" The same may be asked about Unix. The answer of the hour is AT&T and Sun Microsystems, Inc. But Apollo Computer, Inc., Hewlett-Packard Co., Digital Equipment Corp. and IBM have it, too. Or rather a reasonable facsimile of it. But now these vendors say they are going to go beyond their proprietary Unix offerings to create a collaborative application environment as an alternative to the AT&T and Sun version.

The vehicle for this software effort is a nonprofit organization called the Open Software Foundation (OSF), which, as of this writing, has a post office box in Billerica, Mass., and an interim president, Henry J. Crouse, currently DEC's vice-president of strategic relations. New members are welcome for a fee: $25,000 for corporations, $5,000 for nonprofit entities. OSF's initial backers include three European companies, Nixdorf Computer AG, Siemens AG and Groupe Bull. Together with the U.S.-based companies, the seven say they are committing $90 million during a three-year period to make this venture viable.

They also say they are contributing technical features from their own product designs to help create Level 0 of the new operating system, according to Donald J. McGinnis, DEC's Engineering System Group vice-president. The new operating system is expected to make its debut in late 1989, he says.

At the inaugural press conference in May, Thomas A. Vanderslice, Apollo's chairman and chief executive officer, said IBM's version of Unix, AIX, would be a developmental base for the new operating system, along with features from University of California at Berkeley Unix Version 4.2 and AT&T's System V.

IBM President John Akers says that features could include concurrency, AIX's recovery file system and the extensions found in AIX Release 2.0 that run on the IBM RT Personal Computer. According to information in the press kit, Level 0 specifications will also include the Posix standards of the American National Standards Institute, the International Standards Organization, the American Federation of Information Processing Societies, Inc. and the base level of X/Open XPG3.

But it may be a long time before Unix in any version, and from any one vendor, makes significant headway in the commercial MIS arena, says market researcher Marty Gruhn, vice-president of The Sierra Group in Tempe, Ariz. "There are as many deviations of Unix as there are companies selling it. There are no standards," she says. "What's amusing about OSF it that it's 90% gamesmanship and 10% reality."

The reality, according to Gruhn, is that Unix's main users are in manufacturing, government and education, and it is to them that industry suppliers are making their marketing pitches. OSF, like the Corporation for Open Systems and X Windows group, is a marketing forum for participating companies, she adds.

The gamesmanship is being able to say "We, too, will be Unix," Gruhn says, and "in that context, OSF makes sense, but not because [MIS] users want it."

According to a Sierra Group survey taken in March of its MIS Council members culled from Fortune 500 companies, Gruhn says Unix rated 3.25 on a scale of MIS interest, with 10 being the highest. From MIS with manufacturing concerns, Unix rated a 4.9.

OSF's predecessor was The Hamilton Group, which consisted of DEC, HP and Apollo. IBM eventually joined the trio in expressing its concern about AT&T and Sun's agreement to jointly develop a release of Unix to be licensed by AT&T. The four-against-two alignment helped give rise to industry pundits' fanciful designation of the dissenting group as The Four Horsemen of the Apocalypse.

Breaking the four into two pairs, "You have to realize there are two constituencies here," comments Robert Herwick, an analyst at venture capital firm Hambrecht & Quist, Inc. in New York. "IBM and DEC are concerned about penetration of Unix into their installed base," he explains. "Hewlett-Packard and Apollo are too dependent on Unix to be [found] at the end of the [design] line while Sun and AT&T run out in front of them."

What OSF has to offer "is a pale comparison to what Sun and AT&T will offer in the next six months," Herwick says, further observing that marketing "is getting nasty. Users will be screaming 'You can't do this to us,' and they will be voting with their dollars," he adds. "OSF will backfire."

No smoke screen

But James I. Magid, a senior advisor to the New York-based investment bank of Needham & Co., does not think OSF is a smoke screen.

"We have a tip-of-the-iceberg situation here," Magid says. "There's a lot more Unix products out there than people are willing to admit. Today, all those Unix systems are incompatible. But OSF will bring all [of them] into compatibility because customers aren't going to buy [Unix] if it's not compatible."

Regardless, Unix, a distributed operating system by its design, opens the way for greater computing emphasis to be placed on networks, Magid points out. "No one has ever asked the question of what's going to happen to AT&T when the network becomes the computer."

According to Magid, the answer is, "A lot," because AT&T is increasingly moving more data traffic over its voice lines, and no other single company will be able to duplicate the scope of its worldwide network. "Even if AT&T gets out of the computer business altogether, it will get rich carrying all the traffic. That's what the computer industry's fear is," he says.

If nothing else, he adds, AT&T should join OSF to keep its participants honest and to promote faster acceptance of Unix.

Neither Sun nor AT&T was at the press conference; Sun was not invited, while AT&T was invited but declined. The latter's absence prompted Olsen to quip, "My only regret is that AT&T is not here to join us today." — HELEN PIKE

1-2-3/M delays fuel speculation

Lotus Development Corp. has been having problems. The Cambridge, Mass.-based maker of 1-2-3, the best-selling personal computer spreadsheet package, has suffered a series of recent jolts with the flight of key personnel and the twice-postponed introduction of Release 3.0, the long-awaited upgrade to its 1-2-3 mainstay product.

The spreadsheet joins a list of other Lotus product delays. More than a year ago, Lotus's PC spreadsheet division announced that it and IBM would begin co-development of 1-2-3/M, an IBM mainframe version of 1-2-3. Since then, Lotus and IBM have been stingy in regard to doling out any information on the product. And secrecy tends to breed rumors.

"There is a good chance that Lotus has bitten off more than it can chew," says Nancy McSharry, an analyst at International Data Corp., a Framingham, Mass.-based research firm. "I think Lotus has found that programming in the mainframe environment takes an entirely different set of experience, tools and skills than what they are used to [with personal computers]. Writing hooks into the mainframe arena is a big step for a PC company."

McSharry says Lotus may also be having trouble adjusting to programming in C rather than assembler, a problem Ashton-Tate Corp. recently experienced in its efforts to use C to boost the power of its data base software for mainframes.

"The mainframe market is a different culture for the Lotus programmers to be aiming at," McSharry states. "Many of the people still running [software] development at Lotus are ex-hackers. They could be having trouble adjusting to the button-down world of mainframes and big business."

There could be other problems. McSharry says the average life cycle for such products as 1-2-3/M is around three years, starting with conception and design through production and shipment.

"Three years ago, the concept of 1-2-3/M must have looked great," McSharry explains. "You put a PC spreadsheet on the mainframe and have it accessible by hundreds of terminal and PC users. In the interim, however, there has been a big push toward connectivity and networking at the PC level. More companies are also downsizing large systems software to smaller, networked systems. Putting a spreadsheet on a centralized mainframe is not where the market is going, but Lotus, along with many others, probably didn't foresee networking having the impact it has today."

Could Lotus be delaying 1-2-3/M to work instead behind the scenes on a more upscale networked version of 1-2-3? McSharry says it is possible. There is also speculation that the company might be forging a VMS version for Digital Equipment Corp. VAXs. — STAN KOLODZIEJ

Trying times

Continued from page 6

spreadsheet clone, that hasn't been released as a result of the suit."

Far more serious, though, has been the Apple suit. "That's where we have clients calling up and asking what chance Apple has of winning and how long it's going to take either way," Lucash says.

Lucash explains that the Apple suit is unique because it brings the copyright dispute to the interface level. "It means, for the first time, you can walk into a lawsuit without having a direct clone of somebody else's product."

Small developers that have invested their resources developing for Microsoft Corp.'s Windows or Hewlett-Packard Co.'s New Wave stand to suffer the most from the litigation, he says. Suddenly, they must put their products on hold until the issue is resolved. Some may even go out of business before that time.

Lucash, however, does not think the dispute will go on long. "I don't think this is going to go to trial. I think you're going to see a settlement whereby Apple will be able to extract a few more dollars from Microsoft. . . . You know, Bill Gates has always been known as a hard bargainer. Well, in a sense, he's getting a taste of his own medicine now."

But what accounts for the upsurge of legal activity in the software industry? Lucash claims it is the result of modifications of the copyright law made between 1985 and 1986. "For the first time," he says, "the law at least mentioned computer technology. It's taken three years for the courts to work out the basic issues of the new copyright law. And now we're seeing the consummation of that."

He also thinks the new laws will benefit smaller developers, even though they are the ones being hurt in the short run. In time, he says, small developers will be able to use the law to protect themselves from larger, better funded rivals that might otherwise pirate their work.

Other explanations are not so positive. One Cambridge, Mass.-based developer of 1-2-3 add-ins, who asked not to be named for fear of a lawsuit, explains the litigation boom simply and bitterly. He says, "The lawyers, they saw there was money in software and figured it was time to go get it." — MICHAEL TUCKER

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Kavner fights CFO stereotype as he leads post-Cassoni AT&T

In the temporary void created by Vittorio Cassoni's recent and sudden departure as head of AT&T's Data Systems Group, many industry observers and members of the press have placed a big question mark on the ability of successor Robert M. Kavner to fill Cassoni's shoes.

Kavner, AT&T's former chief financial officer, is having no part of it, and he has come out swinging.

"The press has created a kind of personality cult around this whole affair," Kavner says. "There are those who see a chief financial officer and think he's the chief bookkeeper. I'm really tired of it. I'm here to run this business and make it grow and make AT&T a full-fledged member of this industry."

Kavner berates the press, observers and the computer industry in general for a certain narrow-mindedness of purpose.

"I find it a part of the bigoted stereotyping that goes on around here [in the computer industry]," Kavner maintains. "I think that some of the commentary that greeted me [came] from people who don't know me and look at my previous responsibilities as chief financial officer without finding out what those responsibilities were but seeing that it was accounting, therefore, it must be narrow, therefore, he must be a caretaker," Kavner fumes.

Kavner says that since replacing Cassoni in April, much of his time has been spent visiting key customer sites, reassuring users that they have little to fear and that the transition in power will be a smooth one.

"Their greeting has been warm," Kavner says, "because they understand that I have also been a customer and that I have spent most of my career in roles similar to the roles they have. . . . Responsibility for MIS, for the administration of their corporations, for planning, for the strategic positioning of their corporations — all of these were also my responsibility. They're finding it good and comforting that the leadership of the Data Systems Group is coming from one who has their perspective."

But Kavner also insists that life at AT&T in the post-Cassoni era will not fall into a conservative and cautious pattern.

"We'll be making changes, moving ahead, but it depends on the nature of the changes," Kavner explains. "A change from Cassoni to Kavner, which is built on the momentum that we have, is comforting for users. I'm not going to be the next Rambo of the industry, but conservatism is not called for in the kinds of product cycles we live with in this industry."

At least one AT&T user gives Kavner a vote of confidence.

"What Cassoni accomplished was remarkable," says Bill Willard, vice-president of information systems at the Standard Insurance Co. in Portland, Ore. "He gave AT&T a strategy in computers, and that strategy is still in place as far as I can see. Our own systems goals are not contingent on one person or vendor, and I'm sure most other users feel the same.

"I've met Kavner, and what has struck me about him is his intensity of purpose," Willard says, adding that the more important issue Kavner has to deal with now is the question of where Unix is headed, especially in light of the recent formation of the Open Software Forum (OSF). A group of seven computer companies that includes heavyweights IBM and Digital Equipment Corp., OSF is intent on creating a Unix counterweight to AT&T's influence within the Unix market.

Kavner

Kavner says he hopes the OSF members are really serious about promulgating and promoting open systems and, therefore, enhancing the AT&T Unix standard that's already on the market. If that happens, Kavner says, AT&T will find a way to work with OSF.

Kavner also maintains that he does not think something like the OSF will result in user frustration and a slowdown in commercial Unix sales in the short term.

"Most of the OSF members are shipping Unix System V today," he says. "If a customer says to an OSF member, 'Maybe I shouldn't buy your [existing Unix] product now but wait until the new standard comes from the foundation,' a foundation member is going to reply, 'Don't worry. Buy System V now, and we'll have a nice migration to the new standard,' " Kavner claims.

"If you think about that, it says that the foundation members have a need to have some orderly path to one standard in the market. AT&T has the same need. My only worry is that the motives of some of the big foundation members are anything other than promoting open standards. In that case, the foundation will only wind up putting smoke in the air," Kavner says. — STAN KOLODZIEJ

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MANAGER'S CORNER

Just say no to the data base high

Jim Young

Sometimes, old ways are the best. Lately, I am becoming genuinely nostalgic for the simpler days of data base management software.

Today's preoccupation with a sweeping use of data base technology has been justified by the improved functionality and advancements in this area. Certainly, it has been fueled by an increasing user demand for data services.

However, I question whether the current blanket use of data base software is the correct course of action.

Young is managing director of MIS for the Wheeler Group, a division of Pitney Bowes, Inc. in Hartford, Conn.

Data base management systems, data dictionaries, security systems and the like have been conceptually intriguing for many years. MIS professionals have hungered for the controls, the programmer productivity and independence, the consistency and the other features these tools promised.

The tools did indeed deliver some promised advantages, but so captivated were MIS managers with the elegance of the complete concept, that they lost sight of the practical side. They, like Dr. Frankenstein, may have created a monster with an ugly disposition.

Data base software came with some processing overhead. MIS knew that. What it did not realize was that the overhead could show itself in insidious ways like in transaction queuing or in locking out work from a large area of records.

Data management software as traffic cop is admittedly a necessary ingredient if MIS wants to coordinate related data. However, it still adds loads of excess baggage, such as journaling, checkpointing, change control and even accounting overhead. The hope that faster hardware would overcome procedural inefficiencies and the burden of added functionality so far has been ill founded.

Inefficiencies have also emerged in production areas. Certain program changes are no longer a simple affair but require the coordination of many experts and long lead times to allow convoluted data structure changes.

To handle file growth or allow optimum performance now requires periodic shutdown and monumental processing of file reorganizations and file repositioning. In some cases, this process takes several days. And heaven forbid there should be a program abend or disk-drive failure. The levels of protection are enormous but so intertwined that file restores and recoveries often take many hours of carefully orchestrated effort.

All new technologies require specialized skills, but those required for companies to support data base software technologies are especially pernicious. These sophisticated skill needs tend to fragment jobs, complicate normal MIS activity and add more risk and doubt to MIS activities. Data base professionals have become so immersed in the technical details that there is no time left for the important control activities that justified the technologies in the first place.

Moreover, the data base concept implies reliance on a single technical platform, which is tantamount to putting all your eggs in one basket.

The journey into this technical spider's web has been under way for some time. What should force MIS managers to finally draw the demarcation line is that, just as their methods and other technologies are beginning to absorb the overhead and sort out the turmoil, MIS managers are being stampeded into yet another promised land — relational technology. Relational is another case of a concept with many intriguing benefits, but for MIS to conclude that its application must be universal is naive.

To return to an era of relative efficiency and simplicity, MIS professionals must change their belief that all applications cry out for the most sophisticated data technology. They must be assertive in making any planned use of such software justify itself. The following are some rules to help keep MIS focused on what is important:

- **DBMS — no, data base administration — yes.** Don't confuse the two concepts. Data administration is as valid as it ever was, but the use of data base management systems and other tools is not a prerequisite for attentive data management and, in fact, can be somewhat contradictory. Too much mechanical task content means not enough attention to management tasks. In choosing where to use DBMS ask, "Why?" instead of "Why not?"
- **Data base technology must carry its own weight.** Is there some reason why each application must be burdened with any or all of the available technology? Especially when considering integration, MIS should keep in mind that the argument for such shackles must be conclusive.

If MIS managers need DBMSs to handle complexity,

Continued on page 36

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Circle Reader Service Number 7

For better, for worse

Merger partners discuss blending systems, style

BY MICHAEL BALL

BILL MAYER

Faced with consolidating data processing operations when the first and third largest banks in Virginia merged, the resulting Sovran Financial Corp. called in a professional. "We had a consultant look at what we had to do," says Ed Palmer, first vice-president at Sovran. "He advised us it wasn't possible." That was four and a half years ago, and the Norfolk, Va.-based Sovran, a product of the merger of the Virginia National Bank and First and Merchants, forged ahead anyway. It aligned its data bases, settled on a single set of software packages and ended up with a unified DP operation. At least it had one until recently when it bought banks in Maryland, Tennessee and Washington, D.C.

Sovran is just one example of a DP consolidation struggle that is repeated in and beyond the financial community. It seems rarer, in fact, when a company is *not* acquiring, merging with or being acquired by another company. It may take months to make a deal, but it may take years before a DP integration is complete. For many, three years seems to be the realistic time span for an integration project.

Even if the merging companies' hardware is similar, selecting the right software and getting it to understand the diverse data is no mean feat. And if the systems and software struggle doesn't hamper the smooth flow of business, cultural clashes may.

In many companies, the software selection process is highly formalized, replete with committees and subcommittees. In a few situations, particularly those in which a giant takes over a mite, there really is no selection process to speak of; the small organization does what the big one wants.

"The real issue is who has control — ultimately — of the resources," according to Wes Hunt, head of financial marketing for software company Management Science America, Inc. (MSA) in Atlanta.

Hunt estimates that 70% of merged companies immediately combine operations, hastening the software winnowing process. "But 90% or more eventually go for a single data center, usually within a year." He adds that this approach depends on the controlling managers and their philosophies. "Some may leave two data centers for a certain time to appease both sides of the house," Hunt says.

On one end of that control spectrum is Transamerica Corp., an insurance, financial and business organization that has acquired various small companies. Transamerica requires that its acquisitions switch to its software and reporting forms. "We do have corporate standards," says Gary Ho, director of data communications at Los Angeles-based Transamerica Information Services, the branch that handles DP services for the parent company. "For the most part, they just conform to those for [reasons of] economics, ease of operation and reliability."

That is not an easy process for either side, he adds. Transamerica and its new companies' DP shops have to work together to meet those standards. This may mean writing code so data feeds into the corporate system properly, or bringing in software for the new subsidiary or even scrapping the existing DP functions there.

"When both companies have big IBM systems, it makes it easier — they are somewhat homogeneous," Ho says. "When some are using Tandem or Wang equipment, we have a whole new set of problems."

At the moment, some new affiliates are doing some of the migration to corporate standards using Transamerica's IBM mainframes. This is a methodical and slow process, Ho says, but it keeps with the parent's philosophy. "They have their needs, too, and we take

Ball is a Boston-based free-lance business and technology writer.

each on a case-by-case basis."

An even easier type of transition occurred in Birmingham, Ala., when Amsouth, a banking corporation, combined multiple banks into a single one in the early 1980s. The company was one-fourth the size of the parent.

"We had an IBM 3090 class of computer in one large data center with one file system," says Gayle Patterson, vice-president of Amsouth. "The receiving bank's systems were gospel. It was relatively painless, with all the same accounting structures and the same number of digits in accounts." The major differences for the DP staff to deal with were such data base alignment considerations as making sure nomenclatures like "cash" equaled "cash items" and that special services, such as Clifford Trusts, were added in the combined software and data base. These were manual conversions performed by existing DP staff.

As for the major accounting software, Patterson speaks like a controlling company's manager. "The accounting side was not a consideration," she says. "Ours was the best."

Those issues and others also arise when the consolidation is of peers. Take, for example, Sovran, the product of the merger of $4 billion Virginia National Bank and $3.5 billion First and Merchants.

> **"The chairman made it clear that getting MIS together after the merge was a No. 1 priority."**
>
> ED PALMER
> SOVRAN FINANCIAL CORP.

At first glance, the software side looked simple. Banking regulations mandate the use of the same reporting forms and times. Because the two merging banks were in the same state, their data was further regulated into conformity. They both had IBM 3080 series mainframes. And they both used MSA's general ledger software.

However, although "we may have had some of the same software," Sovran's Palmer says, "there was a major restructuring between the releases we used. The data couldn't just be put together." The real software question for Sovran was whether the existing packages could handle the increased traffic immediately as well as handle it if projected growth occurs.

"We started out with two of everything," notes John Brewington, corporation executive officer and head of data processing at Sovran. Most obvious were twin main and remote data centers in the banks' respective Richmond, Va., and Norfolk headquarters. The underlying software issues caused more concern. "If a big bank buys a small one, it says, 'This is what you're going to do,' " Brewington notes. "But we couldn't do that."

As many merging companies do, Sovran mixed to match. It formed selection committees with equal numbers of peer representatives from each bank. It put together two major task forces, one for systems and one for methods, such as communications. Each task force had six to eight subcommittees, or "Swat teams," as Brewington refers to them.

Brewington's system task force looked at software and hardware for functions such as deposits. "This part was not a six-month process. Each would come back and report on what software they chose and why," he says. "We asked them to select the one currently used unless it could not handle the new volume." In many cases, including general ledger, the software proved adequate. At that point, the problem shifted to how to integrate existing data. "In some [cases], such as wire transfer, [the teams] predicted the life cycle and said we should start looking for a newer one," Brewington says.

When the decision was made — largely to stay with existing, common software — the integration began. Even though the consultant threw his hands up at the complexity, VP Palmer says, "from a systems standpoint, there is always a way." In this case, it involved using existing DP staff to compare the software and data formats. "We wrote programs to change the numbering of accounts and routines to read, concatenate and re-sort files," Palmer adds.

Good staff, hard work

While his people had only six months to do all this and could not shut down a bank to give the DP staff breathing room, Palmer says the task was accomplished with good people doing methodical work. He is quick to add that support from top management helped considerably. "The chairman made it clear that getting MIS together after the merge was a No. 1 priority," which included getting whatever amount of runtime and disk space that was needed when it was needed.

He does not expect such a direct path with Sovran's acquisitions of banks in other states. "There are a lot of issues that are not entirely systems [related], like when the changes can be made because of the managers there," Palmer says.

Even in the case of these acquisitions, though, some of the software issues are apparent. Where there is a small Data General Corp. system using a remote IBM mainframe, "the system to go with is the one that does more, and there is almost always one that does," Palmer says.

As always, underlying management

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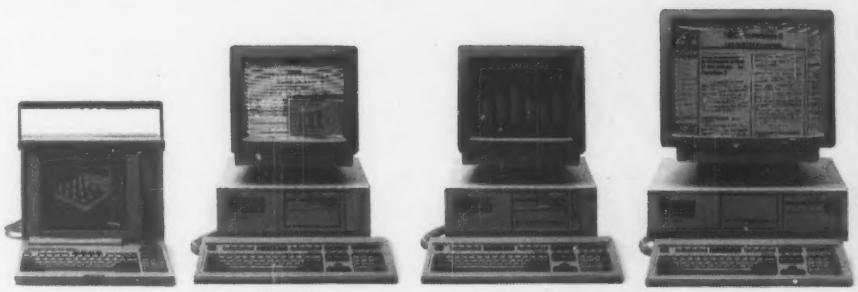

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and DP philosophies are crucial and complex. In these cases, the decision remains whether to go with a consolidated ledger on a single data base or with separate reporting integrated for periodic accounting. The latter is only possible across state lines for a bank, because it does not have to meet the daily reporting requirements. Palmer says he favors consolidation but admits that he does not know in which direction Sovran will go.

Peer pressure

Peer consolidation is not always as clean a process, as with the case of Alcatel NA, Inc. in Hickory, N.C., a manufacturer of fiber-optic cables. It was formed as a joint venture in early 1987, when ITT and France's CGE combined Lynch Communications Systems, Celwave Systems, Inc. and ITT's domestic transmission equipment companies.

Celwave's managers predominated in the new company in number but could not dictate software. There was a mishmash of systems running various packages on Digital Equipment Corp. Decsystem-20s and VAXs and IBM mainframes and System/36 and 38s, recalls Stan Ciepcieliniski, Alcatel's corporate accounting manager. There was no one large data center and no obvious software choice.

"Everything was so fragmented with all the different systems," Ciepcieliniski says. "It was a nightmare to put it all together."

Even though the new entity's DP staff had to make the old data work together, in a sense it had the advantage of starting from scratch. A team evaluated the organization's needs and first picked the computer system, which it decided would be based on VAXs. Then it decided to consolidate the financial data, choosing McCormack & Dodge Corp. applications software.

This decision brought Ciepcieliniski face to face with the hidden nasty side of the process. "The corporate DP guy was from a VAX background, a real DEC man," he says. "I have always been IBM, and I was a bit afraid that there wouldn't be enough software."

For several months, "we reviewed the requirements and where we were headed and then evaluated software vendors," Ciepcieliniski says. To his delight, the software options were fine; there was an adequate selection. The packages were in-house in August 1987. The general ledger package started the following month. Fixed assets were installed in June 1988, with a goal of having both integrated companywide by the end of this year. The firm will then move on to accounts payable.

Alcatel hired consultants to help in the process of discovering all integration obstacles. For example, in the chart of accounts, all prepaid assets must be listed that way in all systems.

Next, the staff wrote its own conversion programs, doing the work for groups of the company one at a time — cable first, then transmission and so forth.

Ciepcieliniski knew the software portion would take several years from selection to total integration. However, he is still a bit surprised by one aspect. "We're almost scared," he quips. "Everything seems to be tracking right. A lot of us are waiting for the bomb to explode."

Merger therapy

Much breast-beating and self-examination accompanied software selection and consolidation when Broken Hill Proprietary Co., an Australian oil company, combined Energy Reserves and Monsanto's oil operation into BHP Petroleum (Americas), Inc. The result was a California-style enforced openness, which seems to have helped the process and carried over into operations.

Fundamentally, the merger involved:

- Joint membership committees for selection.
- A corporate shift emphasizing the DP effort for a year.
- The blending of widely disparate corporate cultures.
- The sacrifice of normal systems enhancements for the conversion.
- The adherence to the typical three-year schedule for the completion of the project.

Initial time pressures came from the Monsanto side. That acquisition had been using the former parent's data center in St. Louis. BHP had six months to move all computer functions to its Kansas City, Mo., center.

Six months "seemed like a reasonable period, at least at the time," notes Roger Sumlin, manager of information services at BHP, "but the process got quite complex." Oddly enough, however, the BHP case is one of those instances in which the business downturn in the oil industry had at least one positive aspect. As Michael Schuckman, manager of financial systems at BHP, puts it, "The price of oil fell out of bed, and it saved us [in DP]. The one good thing about the slowdown is that we stayed on schedule."

That schedule was slated early and included a year for systems consolidation, one for cleaning up all the data and "a third catching up to all the screwups and doing what we had missed in the past two years," Schuckman says. Typical of such efforts, normal software and hardware advances were impossible during such a period, he notes. Sumlin adds, "The downside was that we stagnated a bit for that year."

Even though the Monsanto side of the new company had not controlled the data center it used, software selection was neither quick nor obvious. BHP set up a

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series of committees of six with each committee made up of two people from the parent company and two from each acquired company to deal with software issues. Broken Hill's stated strategy was to choose the best programs and people from each company and create that magical synergy. Sumlin and Schuckman think they have succeeded but are quick to say it was not easy.

The problems on paper and disk at BHP were similar to those of the banks. Each company kept data in its own way, with some unique entries, and others coded differently. These issues were more or less MIS grunt work — identify them, decide on a standard format and write code to convert them.

The selection side was more difficult and less quantifiable. As in many such mergers, one company is more formally structured. In addition, managers on each side have their turf to protect, including staff, ways of working and physical location. It is culture shock, which is not insurmountable but not inconsiderable.

I say tomayto, you say tomahto

During the Sovran merger, "there was a real clash in styles," says Palmer, who came from the Virginia National side. But he says that conflict has been resolved. The combined organization is more formal, with more committees, more memos and more paper.

For the DP side at Sovran, this formalization means signing off on design documents and putting nearly everything in writing, including interactions that previously might have been done face to face. To Palmer's surprise, "It isn't necessarily bad." Such a textbook approach to DP adds a level of approval and review, but it brings with it a clear understanding of what needs to be done.

At BHP, the cultural problems were more intense and are said to continue. They surfaced during the software selection process when it became obvious that Energy Reserves' established data center had the upper hand. "There is still a perception that we just do what we want, and Monsanto's voice isn't heard," says Sumlin, who came over from Energy Reserves. This perception has been heightened by BHP's move to Houston, which caused many former Monsanto DP staff members to look for jobs in Kansas rather than to go south.

The refreshing candor about the conflict started during the software cycle and has carried over into a corporate culture committee. It encourages discussion and resolution of differences. Following the bidding of top management, BHP DP and other staff engaged in team-building exercises. These exercises were both intradepartmental and with managers the employees would be working with regularly. Both Sumlin and Schuckman say the culture committee has played a role all along in getting all sides to state clearly their objectives, and objections.

In that environment, the BHP software selection committees were charged with picking the best product in each category. Schuckman admits that both companies had good packages running on similar IBM mainframe configurations, and after months of analysis, the choice often was a coin toss. However, in a few cases, a previous selection mandated the next. For example, much of the chosen software was from Arlington, Va.-based American Management Systems, Inc. Its Oil and Gas Information System was the general ledger package of choice. The product works only with the company's Revenue Management System package, a crucial component of petroleum DP.

> **Managers on each side have their turf to protect, including staff, ways of working and physical location. It is culture shock, which is not insurmountable but not inconsiderable.**

The resulting software decisions favored the Energy Reserves packages in most cases. Said to be more in control of their systems, this group also used on-line packages whose advantages were recognized in the selection process.

This weighting toward one set of managers is typical of mergers. Half the people have to learn new software and procedures. Understandably, most do not like it.

BHP wants such dissatisfaction in the open for discussion in its ongoing culture committees of peers. It expects to resolve problems and eventually have everyone accept the new reality. Looking back at Sovran's experience, Brewington sees a similar resolution for such necessary conflicts. His bank corporation also engaged in team building to bring the disparate factions together physically and intellectually. "The back-office side of this is manageable," he says, "if you have folks participating and understanding what is happening." He adds that half the people will have to change what they do for a living, and they need to participate all along to help keep them happy and productive.

Schuckman, too, sees the software selection, conversion and use as much a people issue as any other. "If there is one thing I'd do differently," he says, "it is spend more time selling the process. I wouldn't bulldog it through." ✧

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Circle Reader Service Number 9

The high cost of choosing software

BY LELAND G. FREEMAN

Buying software used to be exciting. Evaluation teams were formed. Rigorous benchmarks were set up. Often, the event heralded a newer and more powerful mainframe computer. Big budgets were approved — and then given extensions. Being involved in a major software purchase often meant added honors for any aspiring MIS lieutenant.

Now, buying software can be hazardous to your career. It is no longer obvious how to evaluate software. Vendor's benchmarks seem to produce conflicting, unreliable and rarely reproducible results. New hard-

ware, if it is a necessary part of the software package, generally ends up on someone's desktop — not in a new building. And there's never enough money; when you ask for more, it is a sure sign you've failed. Now a software purchase can leave the wrong types of lasting marks on a career — black marks.

The situation is not necessarily that distressing. But for most MIS managers, the task of acquiring software has become a much more challenging and complex management process than it was previously.

Computing environments that were once defined by hundreds of terminals connected to a large powerful mainframe computer are being replaced by distributed personal computers networked to departmental minicomputers or mainframes. The mainframe has become the data base machine feeding distributed processing organizations. End users are now critical stakeholders in the MIS organization rather than disenfranchised customers. It is no longer feasible to acquire software using the processes that worked 10 years ago. Today, software must be purchased to fit into a distributed computing environment.

Simply moving the processing to the PC and mini environment does not mean that the same software that ran on the mainframe should now run on the smaller machines. Some of it will, but new categories of computing have also emerged. It is important to understand these software categories and the characteristics of each. The areas to watch include:

- Mainframe application development tools for DP professionals.
- Mainframe application development tools for end users.
- PC-based computer-aided software engineering (CASE) front ends.
- Cooperative mainframe and PC development environments.
- Data access languages.
- PC software ported to the mainframe.

The category of mainframe application development tools for data processing professionals is gaining strength. The power and speed of the newer microcomputers have enabled many vendors to port their wares to the PC environment. Products such as Applied Data Research, Inc.'s Ideal-Escort, Oracle Corp.'s Oracle, Cobol compilers and other third-generation languages have delivered much, if not all, of the functionality of the mainframe capabilities to the PC. These products and others have allowed MIS to take advantage of the 100-to-1 cost differential in million of instructions per second between the mainframe and micro. They have also provided DP development organizations with the resources for implementing complete applications. In many cases, the systems implemented in the PC environment are then ported back to the mainframe for processing.

As micros continue to become more powerful and as their operating systems improve, more applications will have their genesis on the PC and their processing done elsewhere.

MIS is not the only department reaping the benefits of mainframe application development tools. End users with their PCs are also getting into the act. In fact, end users are perhaps the largest category of computing to experience the mainframe-to-PC migration. Today, it can be considered a weakness in product strategy if a software vendor has no PC offering. Products such as Information Builders, Inc.'s Focus,

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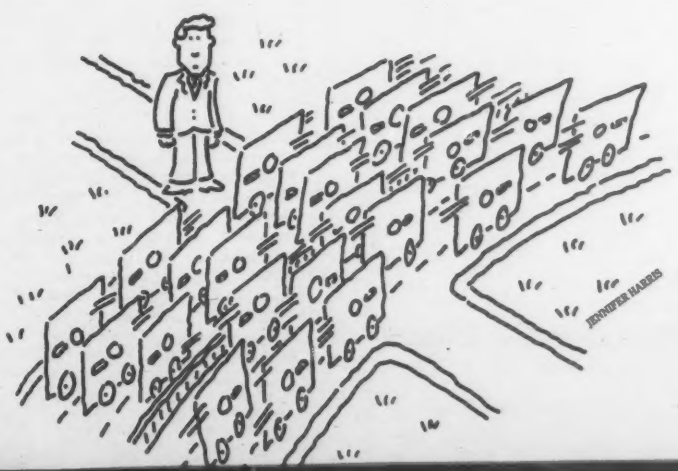


Must Software International's Nomad2, Information Resources, Inc.'s Express, SAS Institute, Inc.'s SAS, Execucom Systems Corp.'s IFPS, Comshare, Inc.'s System W, On-Line Software International, Inc.'s Ramis II and Oracle all have their counterparts running on the PC.

In many cases, the products provide special user interfaces such as forms, menus, pop-up windows and touch screens that make them more friendly to the user. When used with the mainframe version, these products can provide a powerful distributed computing environment. End users are able to implement applications — often without MIS's help — and run them entirely on a micro platform. The mainframe product can still act as a mother ship, feeding data or storing results in a PC-compatible format.

PC-based computer-aided software engineering (CASE) is another emerging technology category. The structured engineering methods of the 1970s and the newer information engineering methodologies of the 1980s can finally be of practical use for analyzing and designing applications. Rather than filling walls with hand-drawn paper documents, systems analysts are now able to analyze and design applications with the assistance and support of specification tools on the PC.

Products, such as Index Technology Corp.'s Excelerator, Adpac Computing Languages Corp.'s Design, Nastec Corp.'s CASE 2000, Promod, Inc.'s Promod, Knowledgeware, Inc.'s Information Engineering Workbench and Texas Instruments, Inc.'s Information Engineering Facility, enable the systems analyst to design and analyze application specifications. More tools are being introduced for this task, mostly in the PC environment.

These tools allow the user to communicate using graphical user interfaces. Various views of the specifications are entered using diagrams, and the diagrams are then translated into data and process specs. The specs are stored in a repository shared by other members of the development team. The software is able to check for completeness, consistency and accuracy of the specification before it is incorporated in the final design. Systems analysts used to try to choke off changes in the design and analysis phases of development because the manual techniques used would entail tedious backtracking. Today, CASE tools facilitate and support change as a requirement and readily adapt to it.

For many CASE vendors, the next step will be to integrate their front-end specification tool with a back-end code generator. Some have already announced offerings that cover the entire software development life cycle through alliances with other vendors. For instance, Index's Excelerator CASE tool links with Micro Focus, Inc.'s Cobol generators.

Cooperative mainframe and PC development environments are another area to watch. When used in combination, the PC and mainframe can provide a powerful development environment. The PC provides the ability to support CASE products and structured engineering methodologies. The mainframe brings to the equation a rich development environment with powerful and established fourth-generation languages and access to corporate data bases. Products that can simultaneously support both platforms provide an incredibly robust development environment. Many of the CASE products are heading in this direction.

It is no longer feasible to acquire software using the processes that worked 10 years ago. Today, software must be purchased to fit into a distributed computing environment.

As specifications are entered on the PC, they are checked and cataloged on the mainframe. Procedures are defined using techniques such as Action Diagrams or menu diagramers. The diagrams are then converted into fourth-generation language code. One product on the market that provides much of this functionality is Corvision from Cortex Corp. in Waltham, Mass. However, many vendors are forming marketing and product development joint ventures to deliver similar functionality. In the future, a PC-based CASE front-end specification tool that has access to an application data dictionary and a fourth-generation language will become the de facto development environment for MIS organizations.

Data access languages are another category that should play a key role when contemplating software acquisition. One of the realities of distributing processing is that data must also be distributed. For products that share a common mainframe and PC architecture, such as Must Software's PC Nomad and Information Resources' PCExpress, data can be distributed in an efficient, proprietary format. However, in a multivendor, open architecture environment, data must be accessible and available for a variety of applications. Fortunately, SQL and the relational data model provide a standard access language and data format suitable for accessing and managing data.

The problem remains that there is not yet a single SQL standard. Vendors have been quick to add enhancements to improve the language's features, but in doing so, they have created a dialect that makes it difficult to universally communicate. Still, SQL provides the best mechanism for accessing distributed data.

While it may seem that the software tools and languages have flowed in one direction — that is, from the mainframe to the PC — the mainframe has been the recipient of products with PC origins. Perhaps one of the most significant but least noticeable areas that has benefited from PC technology has been in C compilers. The use of the C language for building systems software has meant that vendors are now able to implement products indifferent to the environment in which they will run. This has allowed some software vendors to migrate the newer technology PC products back to the mainframe and quietly replace their foundation products.

Other vendors have announced that what's good for the PC will be great for the mainframe. Lotus Development Corp. promises a version of 1-2-3 for the mainframe, and numerous PC data bases could find new homes on the mainframe. In most cases, the use of C has allowed vendors to support one set of source code for all processing platforms.

Mainframe software has also benefited from concepts that first appeared in the micro environment. Interface features, such as pull-down menus, windows and scrollable sceens, are now increasingly appearing in mainframe products. Soon, the distinctions between mainframe and PC software products will be obscure. The user will access all software and data from the PC. Where the processing is performed and the data resides will be inconsequential (to the user, that is).

With these new categories in place, the evaluation and selection of software must change from the ways in which they were performed in the past. Now MIS, with the cooperation and support of end users, must be certain that the features and functionality of software products fit the distributed computing architecture.

A top-down approach

A top-down methodology, which first identifies the applications to be supported, should be used to initiate the evaluation process. Often, approaches such as critical success factors (pioneered by Jack Rockart from MIT) or information engineering studies will help to identify those applications that will yield the highest payoff. Once the application portfolio is understood, the types of tools and data needed to support each application can be specified.

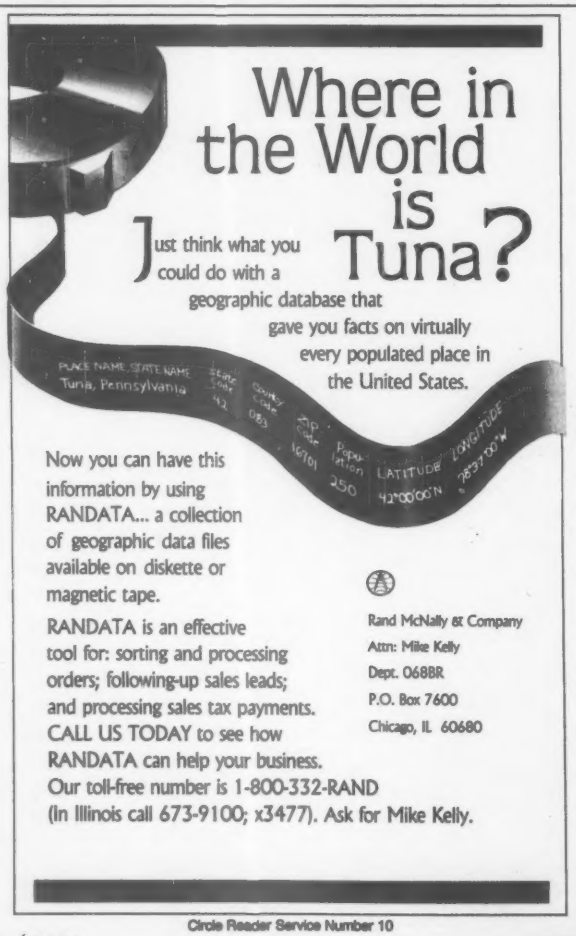
After isolating the appropriate data and understanding the tool requirements for building an application, the actual computing platform can be selected. The choice should fit into the firm's overall information systems strategy. Most likely, the computing architecture will favor implementing applications using a personal computer or a distributed PC/mini/mainframe configuration. The cost differential of computing between the PC and mini or mainframe is becoming too broad to continue sanctioning the mainframe as the dominant computing platform.

It is at this planning stage that individual tools and products can be evaluated. Each software offering can be assessed for its ability to address the specific requirements of the application, data and computing environment. By using this top-down approach, the evaluation team is relieved from trying to distinguish the relative differences of product features. It is more effective to discern if a product fits overall needs than to try to evaluate esoteric features.

Products being considered should actually be run in the proposed environment with conditions that are representative of the real application. Standard vendor benchmarks won't yield much insight.

As a final measure, MIS must assess "soft," less quantifiable product features. How easy is it to train users? What organizations (both internal and external) will support the tool and resulting applications?

Recognizing that computing has changed forever and that end users have a definite interest, the processes used for software selection and evaluation must also be modified. With the proper adjustments, software acquisition can once again become a safe venture. ❖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CHUCK LADOUCEUR

Blind faith: Software and The Crash

BY STAN KOLODZIEJ
SENIOR EDITOR

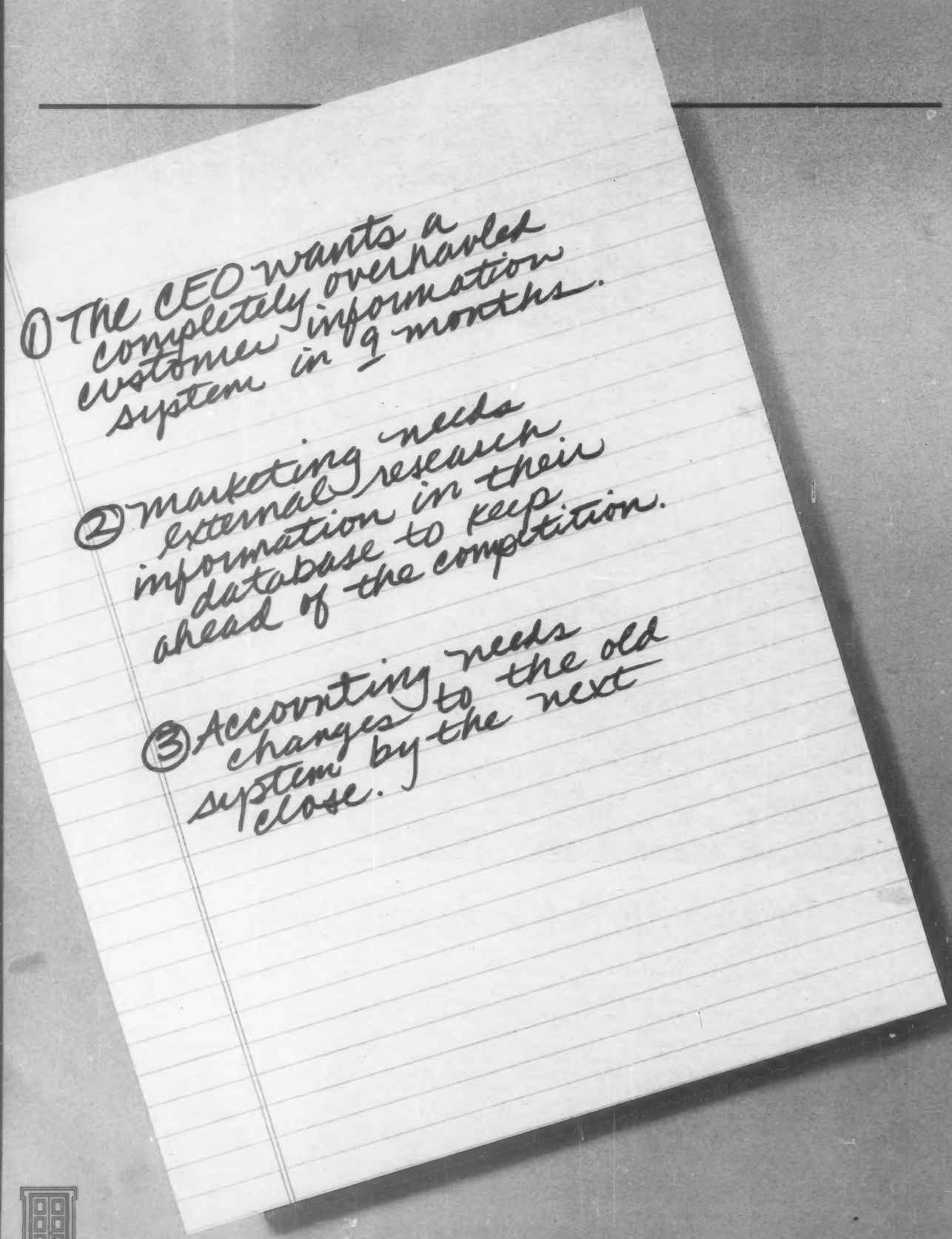
Some call it The Crash. Others call it a market readjustment. But between the lines of the events leading up to and occurring after Oct. 19, we glimpsed in real time and in a graphic form the magnitude of the information era in which we work.

On Oct. 16, 336 million shares were traded on the New York Stock Exchange. Four days later, the number nearly doubled to 608 million — a figure Wall Street didn't expect to see until 1989 or 1990. Investors big and small found the volume of shares traded on Black Monday staggering. So did the computer systems: They were still handling volume in the 300-million-shares-a-day range, preparing for upwards of 450 million shares a day by year's end. The resultant bottleneck caused the NYSE's system to halt and play catch-up.

Although the stock exchange deals in money, it navigates with data. What are shares but volumes of data? Data translated into digital input by tens of thousands of lines of software code. Code, in turn, that represents programs and applications designed to store, run and manipulate information for profit.

In the airline industry, then, the "shares" are rate fares and schedules. At the National Aeronautics and Space Administration, they are computer-aided design files to build a space station. By the year 2000, there will be a financial services market created by juxtaposing the deregulated banking industry and the burgeoning offerings of insurance companies. There may or may not be a Strategic Defense Initiative, but there will certainly be a U.S. Department of Defense and other governmental agencies with huge software projects demanding instantaneous response and dynamic, interoperable code.

How Would You Deal With These Problems?


① The CEO wants a completely overhauled customer information system in 9 months.
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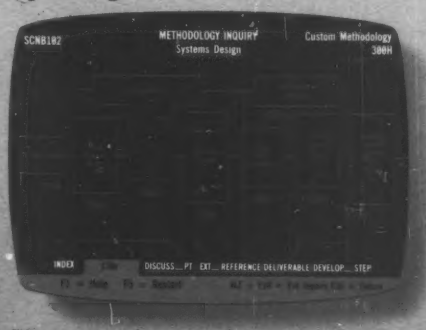

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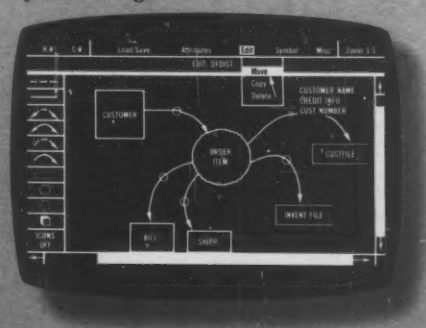

DESIGN/1 is a dictionary-based system for analysts and designers to develop data flow diagrams, paint screens and reports, plus facilitate data design and maintenance. To facilitate better system design, the prototyping facility encourages user participation.

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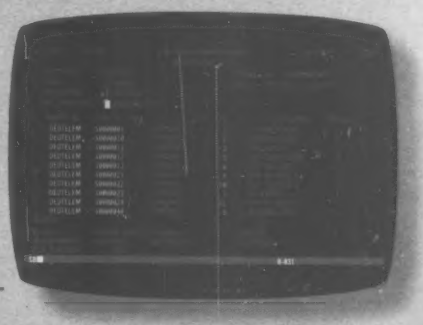

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Like an iceberg, all of what's been mentioned is just the tip. Beneath the waterline, the rest of the Information Age looms in unimaginable size. The global marketplace is spreading beyond the Fortune 500 tier to include thousands of other companies with branch offices, factories, research and development centers and service organizations around the world.

Before the next decade, millions of lines of software code will be written, far surpassing in percentage growth the number of computer boxes made in this country alone. The software will wield an unprecedented and, perhaps, incalculable influence on how we use information to get the job done.

The following is a Computerworld Focus *feature on the stock market's Black Monday as a microcosm of the looming software, and related hardware, challenge.*

There were indicators that the stock market was in trouble, but no one could have foreseen Oct. 19, 1987. And no one could have guessed the strange confluence of events that surrounded the stock market crash that Monday, the day the Dow Jones industrial average did a free-fall of 508 points into history.

The improbable seemed to play a big part in the days leading up to Black Monday. Take, for example, the coincidence of a hurricane that smashed across the south of England a few days before Oct. 19, nearly shutting down trading activity on the London exchange. When the market finally opened, the volume of trading was heavy, putting pressure on the U.S. markets later on.

There were other oddities. By coincidence, the American Stock Exchange (Amex) went live with its new double-capacity market data system on Oct. 19, helping it escape much of the devastation that crippled the New York Stock Exchange (NYSE) that same day (see story right).

It's odd that the crash was surrounded by such improbabilities, because the stock market, and other financial markets for that matter, have come to rely almost exclusively on the processing speed of computers and software to increase precision in financial markets, to narrow the realm of improbability and to make the unpredictable more predictable.

It is a cycle so fixed that it has almost become some primal law of nature: Computers push the market, and the market pushes computers. It is a cycle that probably cannot be broken, yet for a few brief periods during the week of Oct. 19, the cycle faltered badly. The market simply pushed the computer systems of the exchanges too hard. But the resulting financial meltdown has created an awareness of the vulnerability of the markets when systems are pushed beyond their limits.

Although computers predominate in most financial markets, the situation of the crash created a flashpoint of media and government attention on the extra-critical relationship that exists among computers, computer software and the stock markets

. The stock markets' crucial role in the U.S. economy puts incredible pressure on computer technology to keep up with demand. On the NYSE and Amex exchanges, for example, fault-tolerant hardware systems, mass-storage devices and specialized software are considered absolutely essential to handle today's enormous share trading volumes.

Advances in software and hardware are not confined to the exchanges and larger brokerage houses any longer, however. In the past few years, computing power has moved to a whole new type of stock market trader, analyst and investor who uses the power of such systems to gather, analyze and communicate ever greater quantities of trade data.

The quants hit the streets

In the early 1980s, a group of such brokers began storming Wall Street. Armed with their master's degrees and personal computers, they began expounding market theories in technotalk. Many of these brokers, pegged "quants" for quantitative analysts, soon became power brokers and the wunderkinder of the big institutional investor markets. Most were also proficient programmers, developing sophisticated PC investment modeling software.

"They were academics. We called them rocket scientists," says Michael Lipper, president of Summit, N.J.-based Lipper Analytical Services, Inc., a company that publishes financial statistical information. "They came into the '80s with a digital viewpoint and a radical view that everything in the stock market could be precisely measured. That's a cocky attitude."

In the hands of quants, the PC became a weapon to push modeling software to its limit to gain that extra investment edge over competitors.

"What these systems have done is said that people can do things at incredible speeds, so if you can outthink the other guy, even just a little, you can move so much money so fast that you can make a very quick, sure killing," explains Dan DiBartolomeo, president of Northfield Information Services, Inc., a Boston financial consulting firm. "Computers made the process [of trading analysis] so quick that even the tiniest advantage was enough to cause people to stick their necks out," he states.

Such fierce competition affected many other aspects of the investment community. Merrill Lynch & Co. reportedly calls its main trading room the "war room," and DiBartolomeo says that before the crash, a lot of people had assumed almost military-like attitudes, attitudes he says are needed to survive in the pressure cooker environment of trading.

But, he says, these computer-guided quants became blind to the fact that there were considerable assumptions made in the various theories on which their different computer trading models were built.

"To the extent that those assumptions break down," DiBartolomeo says, "they prove not to be practical in the real world. The software models fall apart and all hell breaks loose, and this is essentially what you saw on Oct. 19.

"The Oct. 19 mess was, to a large extent, caused by the unraveling of all the computer models that controlled portfolio insurance or program trading," DiBartolomeo says. "All the mathematical models that controlled portfolio insurance are perfectly valid, but they make the assumption that there is essentially infinite liquidity . . . that whenever you want to sell, there will be somebody out there to buy. If there is a gap, it will be covered by [the exchange]."

On Oct. 19, however, the gap was too great for the exchange to cover, so basically, there was a situation in which there were too many sellers and simply no buyers. The whole thing got out of balance, caused more panic and touched off a technology breakdown in the system of Securities Industry Automation Corp. (SIAC), which serves as the computer operations arm of the NYSE and Amex. The affected system, The Designated Order Turnaround (DOT) facility, is the core of SIAC's vaunted computerized trading operation.

The quants' continual push to put more powerful investment software on more powerful computers was spinning more market control beyond the hands of the investors.

Trading blame: Users at fault

BY HELEN PIKE
SENIOR WRITER

WHILE SCORES OF fact-finding reports on the Oct. 19 crash continue to be written, read, discussed, debated, defended, rebutted and reissued, a question fundamental to the entire financial services market remains: Should the technology or the people who use it be regulated?

From the Brady Commission to the General Accounting Office, the finger pointing on Wall Street has been directed largely at machines and methodologies. But those responsible for designing them at both the New York and American stock exchanges lay the blame at the users' fingertips.

"Regulators and academics think that computers make the markets. Well, people do. The markets are people regulated," says Chris Keith, retiring senior vice-president of technology and product development at the New York Stock Exchange (NYSE). "I never found a computer yet that will pay for an error.

"The perception is that technology caused the problem so technology should be used to fix the problem," says Mark Smith, Keith's professional peer at the American Stock Exchange (Amex). "Technology isn't the problem at all."

Smith, who is vice-president of Amex's technology planning division, adds, "Throttling the technology is not a long-term solution. Government regulation holds back development of different technology. Don't put regulation at the level where it could stymie solutions."

According to Keith, the 1980s bull run has been "a market of fundamental algorithms."

For sheer processing power, the volume of stock trading has moved very efficiently in the 1980s, Keith says. It is an appreciable technological improvement over the back-office crisis of the 1960s and the simplistic solutions of the 1970s that reduced the stock market to an inventory system, Keith says.

"The exchanges today are far more sophisticated," Smith adds. Specialized algorithms, for example, have allowed the exchanges to uncover trading irregularities that opened investigations into a spate of insider trading abuses. The software system that tracks trading patterns, called Stockwatch, was designed by Amex programmers and implemented by Securities Industry Automation Corp., which serves as the computer operations branch of Amex and the NYSE.

The next algorithm frontier to be explored at Amex lies in artificial intelligence. This summer, Amex expects to launch a pilot program based on an expert system that will track trading patterns from an IBM Personal Computer AT. "We will use linear algorithms to spot trading irregularities," Smith says. "It'll be six months to a year before we start relying on it."

In the meantime, Amex continues an equipment upgrade path that had been under way prior to the 508-point readjustment that fateful Monday in October.

On the hardware and software front, Amex is consolidating its data base and order-handling applications at the mainframe level (IBM 3090-class machines) and changing them over to on-line transaction processors made by Stratus Computer, Inc. On the network level, Amex is consolidating its many disparate networks into a single operation using Ethernet.

Smith says, "Technology is our lifeblood."

"The computer models proved fallible," DiBartolomeo says. "But the models also functioned so quickly that there was no chance for human intervention to try and stick a finger in the dike before things went too far."

What is intriguing, DiBartolomeo says, is that none of what happened on Oct. 19 was unexpected. "What was unexpected was the very strange combination of fortuitous circumstances that blasted everybody away," he says, and which computer modeling could not predict. One such event occurred at the Chicago Mercantile Exchange, at which stock index futures are sold.

"The accounting system for futures is strange," DiBartolomeo says. "If I buy a futures contract and it goes up in value, I make money. But in order to secure the fact that I can absorb any losses if necessary, I have to put a certain down payment on the contract that I bought."

> **"You won't see too many people now saying, 'Well, we lost a lot of money on Oct. 19, but look at our $4 million computer center.' It doesn't go over that well."**
>
> GERRY SAWEIKIS
> ATIS, INC.

The Chicago exchange has a peculiar accounting procedure, DiBartolomeo says. Within a given trading day, the exchange acknowledges only debits, that is, those accounts that owe it money, but not the reverse.

"The result was a lot of futures trading firms got into financial difficulties on Oct. 19 because they owed money to the [Chicago exchange] for all their customers who were losing money, but they were not receiving compensatory credit for those customers making money," DiBartolomeo says. "A lot of trading firms curtailed their own trading, and more liquidity was drained from the market."

Computer software models had foreseen a similar event happening, but DiBartolomeo says the market had never before been subject to such extreme price movements.

"And all this time, the computers were processing everything as fast as it came in, sending money that was made into an accounting never-never land, and the system overheated," he says.

Since the crash, PC software has also become important outside the large portfolio-managed institutional investment companies. More individual investors have decided to strike out on their own with software and PCs and to handle their own market investment analyses.

For less than a few hundred dollars, investors can now buy market analysis packages that enable users to plug into a battery of statistical services provided by the likes of Princeton, N.J.-based Dow Jones & Co. and others.

For several hundred dollars extra, investors can buy something like Market Screen from Market Guide, Inc. in Glen Head, N.Y. Market Screen is said to provide detailed analyses of small over-the-counter issues traded on the National Association of Securities Dealers Automated Quotation (NASDAQ) system. According to Scott Saber, a Market Guide account executive, Market Screen gives PC users the kind of heavy market analysis punch that, until very recently, was only available on mainframes and in brokerage houses.

"The Market Screen data base uses more than 30 screening items for 3,400 companies," Haber explains. "With these programs, you can create some nifty trading models." And big brokerage software is no longer the exclusive domain of mainframes. More large systems brokerage software is being squeezed into less expensive personal computers, enabling a greater amount of market information to be disseminated and processed.

Gerry Saweikis, president of Chicago-based software developer Atis, Inc., has worked with Chicago software firm Realia, Inc. to recompile mainframe Cobol-coded brokerage programs to run on IBM Personal Computer ATs.

Saweikis claims that his software compiler enables members of the Chicago Mercantile Exchange to bring their mainframe accounting packages down to the desktop level. Using personal computers, brokers can gauge activity on each client's account and generate daily reports without having to endure the same contention delays that often plague mainframe or service bureau users.

Saweikis also predicts that, with the imminent arrival of extended trading hours, clients will use less expensive personal computers rather than mainframes to process and maintain trading information.

"I don't think mainframes are going to handle 24-hour-a-day trading, because [mainframes are] too expensive," Saweikis says. "Besides, the 1987 crash has put a new light on large systems used in brokerage modeling. You won't see too many people now saying, 'Well, we lost a lot of money on Oct. 19, but look at our $4 million computer center,' " Saweikis explains. "It doesn't go over that well."

There are still the big systems software houses supplying big systems software for the big brokerage houses, and

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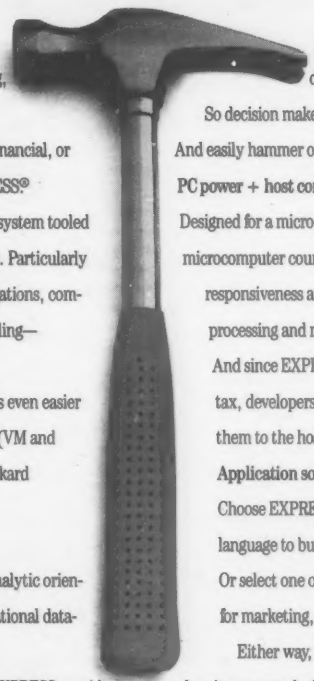

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such customized broker software can be immense. Cytrol, Inc., a Minneapolis-based mainframe custom software house, for example, has been providing order-routing software systems that run into millions of lines of code and are used by some of the largest investment houses on Wall Street. They have also built large software-driven automated systems that support retail equity trading at Shearson Lehman Hutton, Inc.

The growing capacity of brokerage systems puts increasing pressure on the major exchanges to provide more flexible links between brokerage programs and exchange systems.

Ken Boyles, senior vice-president of domestic capital markets at Shearson Lehman Hutton, gives as an example his company's mainframe order-match system, which links directly with SIAC's DOT system. Boyles also says his company is heavily into developing large expert systems to give its brokers advantages over rival brokers.

Another type of large systems software transforming brokerage houses is Data Kinetics Ltd.'s Tablebase, a mainframe package that is said to eliminate much of the I/O drag associated with current data base systems in on-line transaction processing.

Currently used by such financial heavy hitters as Goldman, Sachs & Co., Shearson Lehman Hutton and Charles Schwab & Co., Tablebase juggles high-volume data directly within memory and avoids the delays inherent in moving critical data between memory and direct access storage devices.

"Most computer vendors have attempted to solve performance issues by increasing processor memory size and speed," explains Donna Ronayne, marketing manager at Ottawa-based Data Kinetics. "The secret's in the software."

Clients agree. Ray Dyba, manager of systems and programming at the Brokerage Information Services Group, a division of Automatic Data Processing, Inc. (ADP) in New York, says the software has enabled ADP brokers to handle more market data within the very tight window of time brokers have to settle daily transactions.

"That means we can now fit in more clients," Dyba says. "It's given us 30% more capability right away." The NYSE, though it would not comment on the product, says it is interested in Tablebase and is evaluating the software.

But all this software and computer capacity within the stock market was the very thing that helped overheat an already volatile, shaky market situation.

Q AND A

Kenneth R. Leibler

Exchange of ideas: Amex chief prepared but not panicked

Kenneth R. Leibler is president of the American Stock Exchange (Amex) in New York and has been credited with being the chief architect behind much of the new product development and trading technology introduced at Amex during the past few years.

Leibler joined Amex in 1975 as a director in the options division and worked his way up through the ranks. In January 1986, at the age of 36, he became the youngest president in Amex's history as well as the youngest president of any exchange in the U.S.

In addition to his duties as Amex president, Leibler serves as chairman of Amex Commodities Corp. and is on the board of the Securities Industry Automation Corp., the data processing arm of both Amex and the New York Stock Exchange and often the center of the storm of criticism following the stock market meltdown of Oct. 19, 1987.

Leibler spoke recently with Stan Kolodziej, *Computerworld Focus* senior editor, about the increasingly critical role computer systems play in U.S. financial markets.

Computer systems at the U.S. stock exchanges have come under criticism following the events of October 1987. It seems like a no-win situation for the exchange computers. Do you think the computer systems and those who run them have been made scapegoats throughout this affair?

I think the debate is not really about the proficiency of the exchange technology. I think the debate is really about the appropriateness of high technology in the stock market today. I think the two are really being confused.

The systems performed extremely well under the avalanche of data that fell on them last October. Some people feel computers increase trading volatility, while other people feel the system's efficiency helps prevent volatility by keeping the markets effectively linked to futures trading. I think the debate is really about whether one thinks those computer systems ought to be able to be used during the really critical periods of trading.

How do you feel, then, about suspending market access to exchange computers at certain critical trading times? One implementation, a so-called circuit breaker that stops program traders from using the exchange computers when the Dow Jones average swings 50 points or more either way, has been a qualified success.

I think such measures treat the symptoms of the problem. They're short-term measures and haven't proven to be very effective. So I think over time the answer to the problem is not to close the systems to traders.

The crash has generated all kinds of official reports, commissions and hearings resulting in a number of other recommendations aimed at strengthening the stock exchanges and the financial markets. Are these changes going to entail massive readjustments of the Amex systems and the systems of other exchanges?

Not at all. One of the interesting things about the crash is that prior to it, we at Amex spent 18 months virtually doubling the capacity of our market data system. By sheer coincidence, the Amex system went live the morning of Oct. 19, and we were obviously not aware of what the market was going to do that day. It was incredible timing, and it was also one of the reasons that the Amex did not suffer any meaningful queues or backups into our market data system that day.

I feel the other exchanges, especially the New York Stock Exchange, are working to make sure what happened to their systems the week of Oct. 19 will not happen again.

The real problem in upgrading the exchanges is treading that fine line between building the systems up enough to handle anything that comes at you and building expensive excess capacity that will sit there and virtually never be utilized.

Isn't some excess capacity unavoidable?

Yes, because in a sense we look at ourselves as a utility, ready to handle peak periods.

Is there anything that the crash really brought into focus?

One thing is the clear interdependency of the markets here and internationally. The experience confirmed the strategy that the Amex has been pursuing for the past few years.

We put together the first linkage between two primary equity markets of two countries, Amex and the Toronto Stock Exchange, and we also have a linkage with the European Options Exchange in Amsterdam. We believe that much of the globalization that will occur in the future will likely be in linking international markets for trading 24 hours a day in each market, as opposed to just duplicating each other's markets as has been the case.

We're talking about more market globalization and increased hardware and software capacity in the financial markets at a time when it appears that many individual investors are tying big program traders and computers together as the major villains in the crash. How do you reconcile the continued buildup of computerized trading with the public's apparent increased criticism of automated markets?

Clearly, you're right. I think the biggest problem we face is the perception of technology rather than what it is. I think it's important to restore the confidence of smaller investors in the market. We have now reached the stage at which the technology has almost outpaced the ability of the markets to absorb the kinds of orders that can be delivered to the technology, and I think that has led to the common view that somehow technology is causing the ongoing market problems.

And that does not change the perception with individual traders that somehow this kind of trading caused the crash and that somehow this kind of trading puts them at a severe disadvantage. That's a very serious problem for us because the markets need the small investors.

Where does that leave the small investor who feels that computers have become the exclusive tools of the big traders?

There's a case for that. Clearly, the use of many of these devices [exchange computers] is one that the small investor is not going to have access to [but] will continue to be used by larger investors. I just think that fairness, however, dictates that, ultimately, smaller investors are probably going to have to have to change their style of investing or perhaps join mutual funds or institutionalize their investments in a way that, if they wish, they would have the ability to do these things through a fund or through some other kind of institutional money manager.

I think small investors acting on their own are facing a tougher market today.

The economic barometers were already indicating trouble in the months before the crash. A sense that the stock market might be getting out of control had already been intimated by David Ruder, president of the Securities and Exchange Commission (SEC). In an Oct. 2, 1987 speech in Chicago, the president of the SEC alluded to the possibility of imminent financial meltdown because stock markets were becoming too complicated for regulation.

On Oct. 19 and Oct. 20, trading on the NYSE surpassed 600 million shares each day, almost double the previous single-day trading record in the NYSE's history. During the week leading to Black Monday, the Dow Jones industrial average spiked frequently, gyrating wildly from Oct. 16 to Oct. 19 and afterward.

"We had five consecutive days in which the trading volume each day was higher than the previous single-day trading record," explains Charles McQuaid, president of New York-based SIAC. "What we had to do was hold things together on the edge for five days, against a volume of trading that nobody in the world imagined we would see for quite awhile."

An especially bad scare came on Oct. 16 when large program traders controlling more than $80 billion in pension funds became panicky with the market situation.

"When the signal went out to protect themselves, the program traders realized that $80 billion worth of futures wouldn't make it through the gap," explains Lawrence S. Spiedell, a trustee with Boston-based Batterymarch Financial Management. "The panic was starting and so had a lot of selling."

GAO postmortem

In a postmortem examination of the crash, the General Accounting Office (GAO) detailed what had happened to SIAC's systems on the first day of the problems.

"On Oct. 16, the system was halted once, for three or four minutes, because the exchange computers' internal transaction counters, which control the passing of transactions to other computers, overflowed," explains Aletha Brown, a GAO evaluator who contributed to the report.

It seems so inconsequential — the computers down for only a few minutes — but the psychological effects ripped through the investment community, making an already bad situation worse.

The delay in getting market orders to the trading floors was devastating. As the market teetered on the brink, and the Dow Jones index continued spiking, investors panicked, more trade orders came flooding in and the buildup continued until the backlog stifled SIAC's 20 specialized trading systems.

In the aftermath of the crash, exchange officials rushed to the defense of their computer systems and programmers. McQuaid said, simply, "Under the circumstances, the computer systems came through admirably."

Others were not so charitable. The GAO's was not the only postcrash autopsy that pointed an accusing finger at SIAC's computer systems. The findings of a presidential task force convened by investment banker Nicholas Brady concentrated mainly on regulatory matters and the mechanisms of stock markets but also recommended that computer system capability be expanded as soon as possible.

A separate report issued by the SEC looked briefly at the computer problems at the NYSE and other exchanges but shied away from direct criticism, in part, some observers maintain, because the SEC does not have the necessary expertise to go in and do a critical systems analysis itself.

According to one SEC management source who wished to remain anonymous, "We get market data from SIAC, but we do not know what systems they are using, and I don't think that's our concern." The employee adds, however, that he thinks the criticism leveled at the SEC is useful, because "it will require us [the SEC] to change our attitude about computer systems."

But according to John Brousa, vice-president of computer operations at SIAC, his corporation had been adequately preparing itself for years for a trading onslaught by acquiring Tandem Computers, Inc. fault-tolerant computers and exchange software developed in-house.

Before their time

Brousa says, in fact, that he and fellow programmers had been creating software programs to help jury-rig computer systems with fault-tolerant qualities before Tandem introduced the concept in 1978. Now, with 20 on-line Tandem systems in place, Brousa and his colleagues have, in the past 10 years, used Tandem's PAL programming language to produce the brunt of the trading software on the NYSE and Amex trading floors.

"In the early 1980s, the NYSE calculated that the exchange trade volume would soon reach 150 million shares a day," Brousa says. "Many people laughed at that, but the NYSE was right.

"In 1986, the NYSE said we would reach 250 million a day in 1987 and 400 million in 1988. Those were substantial increases in trading projections and normally more than adequate. Then came the deluge."

Still, SIAC and the NYSE and other

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exchanges have felt pressure to making changes to their computerized trading systems. SIAC's DOT computerized exchange system, for example, has been in a state of flux.

The NYSE, expecting increased trading volume, has invested $20 million in a new 7,000-sq-ft equities trading floor to augment the exchange's existing 30,000-sq-ft trading area.

In January, Richard Grasso, NYSE's executive vice-president of capital markets, declared, "It is the NYSE's goal to manage a 600-million-share day by year-end 1988 as efficiently as we now handle a 200-million-share day."

To that end, SIAC has been implementing necessary changes: memory increases and restructuring for DOT; program changes to the limit-order system to reduce bottlenecks during heavy-volume traffic; and the replacement of the automated pricing and reporting system.

Sprucing up the place

NYSE improvements also include a new telephone system, more compact electronic displays and an additional controller room housing electronic support equipment. The number of electronic display microprocessors, known as "books" in the financial industry, has increased by 70% to a total of 370 units, which are linked by a Contel Corp. local-area network. The number of stocks on electronic display books has increased by more than 140%. According to NYSE officials, the increase in the number of display books reduces the overall need for printers, and that's probably a good thing, because the line printers on the trading floor simply seized up and refused to operate on Oct. 19.

To highlight its achievements, the NYSE recently conducted two showcase simulations that recreated some wild trading swings on a high-capacity trading day.

NYSE has also put in place a few "circuit breakers," such as the controversial 50-point spread collar, a plan that will suspend use of the exchange's computers by index arbitrage traders when the Dow Jones index moves 50 points up or down from the previous day's close. Such market collars were expected to cool market volatility but have failed on a number of occasions since they were put in place in February to stem some major market fluctuations.

Even the National Association of Securities Dealers, Inc. (NASD), which conducts a market for dealers of over-the-counter shares, has doubled the number of its high-end Tandem TXP processors since the crash and is in the process of upgrading its NASDAQ Quotation and Small-Order Execution System. Although NASDAQ was only slightly affected by the crash and its aftermath, NASD has implemented extra systems capacity.

SIAC's Brousa, however, downplays the changes involved in the beefing up of the NYSE and Amex exchanges.

"Most of the suggestions that have been made by [task force leader] Brady, the SEC and others do not have any implications in terms of [software] logic in our systems," he says. "They mostly involve structural changes that will redistribute data among brokerage firms."

Much of the innovative systems software development at SIAC had already been put in place when SIAC was pioneering its own fault-tolerant designs, Brousa claims.

"We had on-line systems as far back as 1965," he says. "Through hard programming work, we could actually develop software that could turn IBM 360 computers into fault-tolerant machines with shadow backup systems.

"By the time fault-tolerant machines hit the market in the late '70s, the transition was easy for us since we had been there for awhile," Brousa explains.

Working amid what may be considered the cutting edge of on-line transaction processing, Brousa has been fielding many calls from financial services organizations, such as banks and insurance firms, interested in finding out what his company has done with its fault-tolerant systems, past and present.

> **"It is the NYSE's goal to manage a 600-million-share day by year-end 1988 as efficiently as we now handle a 200-million-share day."**
>
> RICHARD GRASSO
> NYSE

"It's getting to the point where I can't handle it anymore," Brousa says. "We don't have the time to sit down and talk to all these people. And we find that we're getting requests from other industries, like the airlines. A lot of companies are interested in what we're doing."

Northfield Information's DiBartolomeo says that despite last October's fiasco, computers are so inextricably involved with trading and financial services that any turning back of the clock would be unthinkable. And Brousa says that while traders and investors may have been knocked back on their heels a bit, computer-based investing strategy continues to define the rules of trading.

The quants may yet have their revenge.

Senior Writer Helen Pike contributed to this article. ❖

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Circle Reader Service Number 14

Mixed signals for Unix

Market jammed with vendor choices

BY MICHAEL TUCKER

Unix is hot. It's more than hot. It's scalding. It's steaming. It's quicksilver and lightning with a laser beam kicker. Just try to keep track of the activity surrounding it — alliances, partnerships and new products from a host of different vendors.

Usually, when this kind of thing happens, it means that a company or a group has emerged to take charge of a market and lead it, set standards and provide a setting within which smaller companies can play — rather in the same way that IBM led the personal computer boom in the early 1980s.

Is there, then, some similar company or group of companies controlling Unix today? Who's running things, and what are they after?

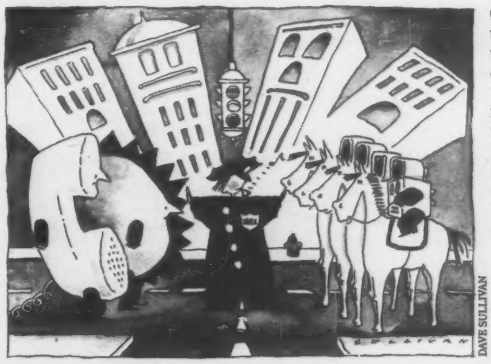
The answer gets really confusing. You want a leader for Unix? No problem. You've got dozens of leaders to choose from.

The leadership of the Unix industry has always been a curious thing. At first, nobody wanted the position. Now, everybody does.

Unix was developed in the late 1970s by Bell Laboratories, more or less as an exercise in pure research. It was not viewed as a commercial product, partly because, at the time, AT&T was restricted from entering the computer business and partly because machines that could most benefit from the operating system — powerful but highly interactive systems — existed in only a few installations.

Because of these obstacles, Unix leadership fell to universities. AT&T was basically handing out copies of the operating system's source code to just about any organization that wanted it, and schools were a natural target because they have historically fostered experimentation. The first real standard Unix emerged from one of these schools, the University of California at Berkeley with its Unix Version 4.2. The academic setting also gave rise to the operating system's first commercial successes, one of which is Sun Microsystems, Inc., which was started by University of California at Los Angeles alumnus Bill Joy.

In the early 1980s, AT&T went through its court-mandated breakup and, as one of the results of the ruling, was allowed to enter the computer arena. The company rediscovered Unix, produced the System V version of it and offered this product as the new standard. Essentially, the company offered Unix as the natural heir to Microsoft Corp.'s MS-DOS and as a natural MS-DOS-like open operating system for machines ranging from multiuser minicomputers to mainframes. A special subdivision of the company, AT&T Information Systems, was formed to promote AT&T in the computer field.



DAVE SULLIVAN

At first, particularly between 1984 and 1985, it seemed that AT&T Information Systems' success was assured. But by 1986, AT&T had lost millions of dollars in pursuit of the computer market. Information Systems ceased to exist as a separate company title as well as an organization in 1987 when it was folded into the parent company.

Why did AT&T Information Systems fail? The answer to that question varies depending on the person asked. AT&T critics usually attribute the fall to the company's inability to make the switch from a technology-driven to a market-driven organization.

AT&T's partisans naturally claim otherwise. One argument is that AT&T Information Systems simply suffered from bad timing. "It's like this," says an AT&T employee who asked not to be named, "Unix needs a big processor to be effective. In those days, the PC market was dominated by 16-bit systems. Sure, there were a few [Intel Corp.] 80286s around, but not many. If we'd made the push in 1986, when the [Intel] 80386 was on line, it would have been a different story."

Whatever the cause, AT&T looked pretty much out of the Unix game by the end of 1985. The field seemed clear for anyone with the will to claim leadership of Unix.

A collection of organizations was more than happy to make a bid for that role. A group of independent Unix vendors, roughly united around the Posix committee of the Institute of Electrical and Electronic Engineers, Inc. and with Sun as the first among equals, emerged as the alternative to AT&T. It was a powerful and natural alliance based solidly on the common interest of all its members to keep Unix as open as possible.

Then, in late 1987, the bombshell dropped. Sun, the champion of open systems, the foe of proprietary solutions and white knight of the Posix committee announced that it had teamed up with AT&T.

The AT&T-Sun alliance shook the Unix world as nothing had before. It was unthinkable. It was unbelievable. It was as if Luke Skywalker had signed on as captain of the Death Star. The independents were terrified that the AT&T-Sun union would turn Unix into a proprietary system.

Under the terms of the agreement, AT&T could acquire approximately 20% of Sun. Moreover, the two firms would cooperate on a common version of Unix on a specific chip — Sun's

Tucker is *Computerworld Focus*'s features editor.

Scalable Processor Architecture (Sparc).

A short time before the AT&T-Sun alliance, Sun announced Sparc. The product became the terror of the independent Unix vendors, because they were confronted with the possibility of Unix dominated by AT&T and optimized to run on Sun-dominated processors. While other vendors could license both the new Unix and Sparc, they would still be at a tremendous disadvantage.

Ulterior motives?

Sun and AT&T have done their best to allay the fear that Unix might become their private property. But the general feeling of the Unix community is summed up in a recent report by Sanjiv G. Hingorani, vice-president at New York-based Salomon Brothers, Inc. "AT&T's agreement with Sun Microsystems to develop a modified version of Unix System V is an attempt by AT&T to regain control of Unix," he says.

And the pact is a superb way to regain the Unix throne. Most major industry observers agree that each company has brought much to the arrangement, adding what the other lacked. Strangely enough, however, there is some dispute among analysts regarding just what each vendor brought to the table. There is a general feeling that Sun is now the leader in Unix technology and that this advanced technological ability was what AT&T was after.

Other analysts offer a different motivation. "AT&T wanted Sun's marketing ability," says Gig Graham, director of software services for Stamford, Conn.-based market research firm Gartner Group, Inc. "Sun likes to think of itself as a technical company, but really, it is a marketing engine. They are, in effect, beauticians. They were better able to dress up the old girl [Unix]. They were able to take the ugly child and make her a beautiful woman."

Sun spokesmen take a middle course. Bill Woo, Sun's manager for strategic planning and business development, characterizes the technical side of the equation as more of an agreement among equals by which the leader of the Unix 4.2 world, Sun, and the leader of the Unix System V world, AT&T, have combined forces. "The equity agreement has very little to do with the technical alliance between the two companies," he says. The equity agreement "is really a reflection of the fact that Sun needs a lot of money to grow. We'd planned a second stock offering, but then AT&T said, 'Hey, we wouldn't mind investing.' It was really just a source of cheap capital for us."

Woo says the fact that AT&T can purchase as much as 20% of Sun is also easily explained. "They can take more [than 20% of Sun] only if someone else does," he notes. "You can look at it as a kind white knight arrangement to prevent hostile takeovers."

Anti-Sun-AT&T front

Others see AT&T as knight of a distinctly darker hue. The independent Unix vendors were seriously concerned that the union would eventually shut them out of the Unix business entirely, so they began to organize. By late 1987, an anti-Sun-AT&T front was beginning to take shape. Basically, according to a Unix insider who asked not be named, the opposing group consisted of "a bunch of people who had nothing in common except that they were all mad."

According to Salomon Brothers' Hingorani, the leaders of this group were Digital Equipment Corp., Hewlett-Packard Co. and Apollo Computer, Inc. Some observers originally included Motorola, Inc. in that group — which, had that company been included, could have been decisive, because until the defection of Sun with Sparc and the similar hiving off of Apollo this year with its own Prism architecture line of processors, Motorola chips had almost defined the Unix market.

The front took the name The Hamilton Group because, as the rumor goes, its first meeting was at a DEC facility on Hamilton Avenue in Palo Alto, Calif., the site of a laboratory for application development of Ultrix, DEC's proprietary version of Unix. The Hamilton Group began to discuss the creation of an alternative Unix standard, something that would be like the Sun-AT&T version but that would give its users independence from Unix System V. For a short period, it seemed that the Unix world had neatly split, perhaps forever, between a System V camp and a Hamilton Group Unix camp.

As the Hamiltonians searched for a viable alternative to System V, Sun and AT&T did their best to woo away its members. Soon after the Uniforum Unix trade show in February, Motorola and AT&T announced that they had come to an understanding. The two companies would work together on a joint version of Unix that would run on all Motorola-based systems. In effect, Motorola got what Sun already had in terms of access to Unix source code. Similar agreements with other chip vendors were said to be in the offing.

Back to sunny Italy

Still, The Hamilton Group remained a contender for the leadership of Unix, particularly because the Sun-AT&T effort was suddenly destabilized in March. At that time, the head of AT&T's computer effort, Vittorio Cassoni, abruptly returned to his native Italy and his original employer, Ing. C. Olivetti & Co. It is not at all clear what this means for AT&T's place in the computer world.

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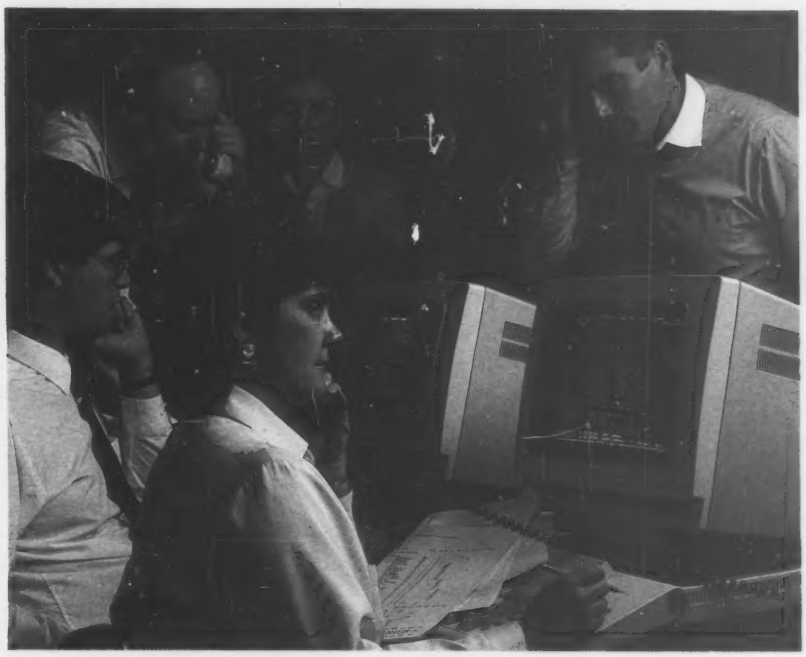

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In the meanwhile, The Hamilton Group took on a new persona. In the spring of this year, the group consolidated around its most committed members — DEC, HP and Apollo — and a new player, IBM.

DEC, for its part, had been widely promoting itself as a Unix partisan. In the early part of this year, it conducted a public opinion poll in which industry observers were asked who they associated with the Posix standards effort and whether DEC could or should be a chief player in that effort.

A reincarnation

Then in May, the Hamiltonians and a few others banded to form still another group — the Open Software Foundation (see story page 8). This assemblage may or may not be an attempt to create a new version of Unix. It is unclear at this time.

So by the middle of 1988, it was apparent that no one was leading Unix. Or rather, the Unix leadership role remains what it has been all along, a Hydra, an entity with many heads. Hingorani notes that "the ultimate Unix of the future will not be a single operating system or even a single operating environment. Rather, it will be a group of operating systems that will hopefully be based on only one or two standards."

End users of Unix, meanwhile, don't know what to think. "What this has all done is confuse the hell out of end users," says Robert Ackerman, vice-president of X/Open, a Unix standards group composed of both U.S. and European hardware vendors. "It looked like we were finally getting a standard, and now it looks like chaos again."

In fact, in recent weeks, X/Open has found itself becoming an open systems lifeboat. Refugees from the various Unix communities, uncertain of the future, have been showing up at X/Open gatherings.

But what is the origin of this activity? Why is Unix, which lags behind MS-DOS in market share, suddenly so important? The answer to that may be with the Intel 386.

Today, 386 systems are becoming common. Other inexpensive 32-bit processors are showing up on the market as well. Logically, then, Microsoft, which makes Xenix, arguably the oldest and best known desktop Unix, should be superbly positioned to exploit an emerging market for desktop Unix boxes.

Yet there have been reports that Microsoft has held back in marketing Xenix for 386 systems. While those reports are difficult to prove, it is true that at recent conferences Microsoft officials have said that they envision Xenix as an operating system for multiuser environments. The personal market is reserved for the company's version of IBM's OS/2, which is multitasking but not, in current versions, multiuser. Indeed, Microsoft officials privately confess that their biggest problem is explaining why OS/2 and Xenix do not compete.

The general feeling in the Unix community has been that the problem will never go away, because the two do compete. In fact, it is believed that the competition will only grow more heated as OS/2 takes on more and more Xenix-like characteristics.

Yet Microsoft's single largest customer is IBM. IBM is promoting OS/2 for its Personal System/2 products, and even if it weren't, the company already has its own Unix version — AIX. IBM has announced that AIX will be soon run across its entire product line, from PS/2 to mainframe. Thus, public opinion says, Microsoft cannot afford to push Xenix too hard because it would then be perceived as a rival to OS/2.

Cruz control

If public opinon is right, it would explain widespread reports in the Unix community that leadership of Xenix seems to have shifted to Santa Cruz, Calif.-based Santa Cruz Operation, Inc. (SCO). SCO is Microsoft's licensed second source for Xenix. The company has been actively pushing Xenix toward the AT&T camp and pushing it as an alternative to OS/2.

So the reason that Unix has become newly important is that Unix vendors — and Unix rivals — say they believe that the operating system has the chance to dominate the desk top. They claim there is a window of opportunity on 32-bit personal computers while OS/2 is still aborning.

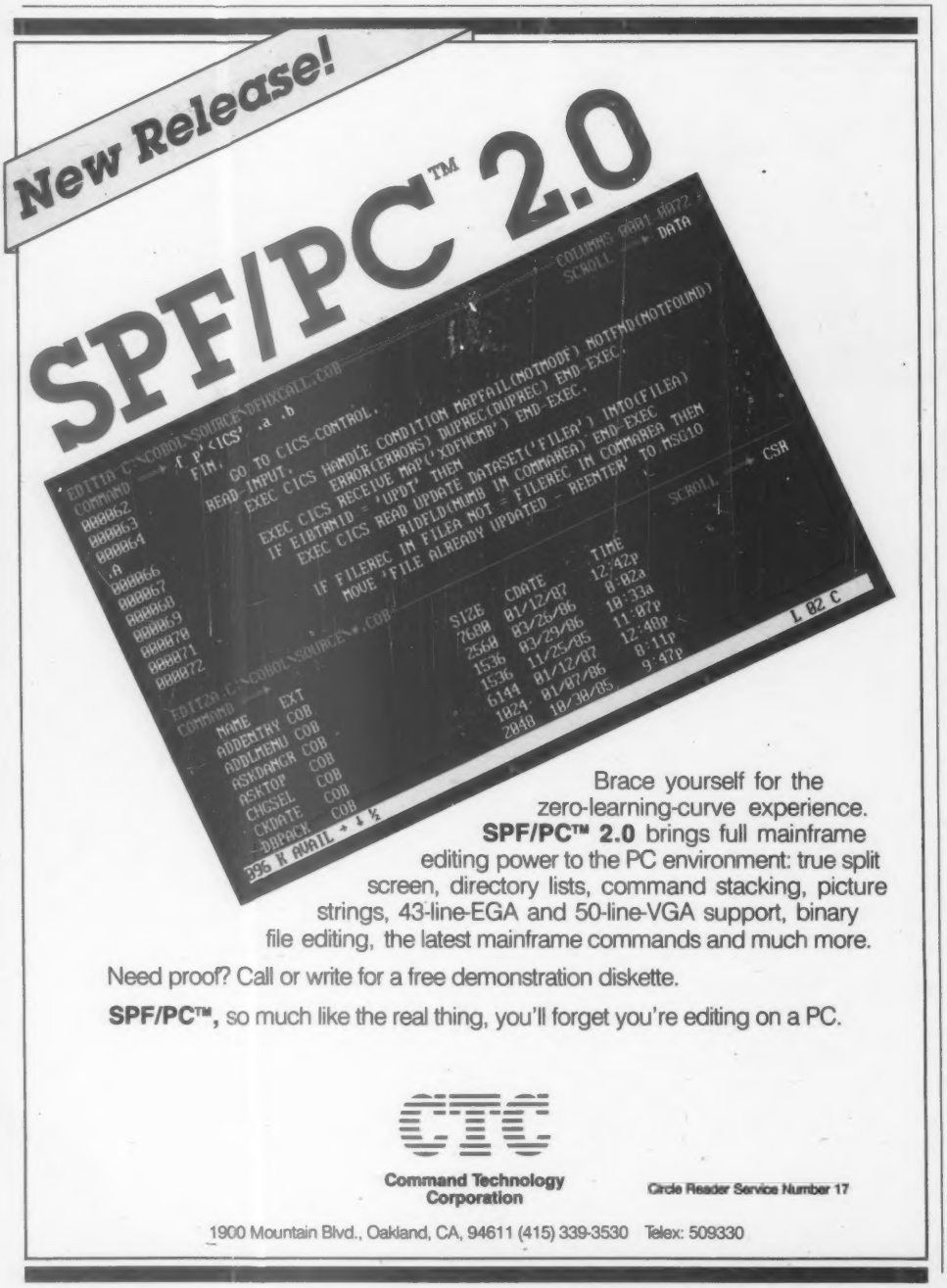
"We feel the key is the desktop," Sun's Woo says. "That's where Unix is going to clash with OS/2. We feel Unix can beat the pants off OS/2, but the key will be applications." He also predicts that within 18 months there will be Sparc-based desktop systems competing with 386-based PCs and PS/2s.

"A lot of people are concerned about OS/2," notes Herb Gepner, senior editor of software at market research firm Datapro Research Corp. in Delran, N.J. "It's not clear where OS/2 is going. Unix, on the other hand, is a known quantity."

"I agree," says Eric Miles, vice-president of systems software at Amdahl Corp. in Sunnyvale, Calif. "There will be a battle for the desktop, evolving into a battle for the mini. Finally, you'll see Unix as a legitimate option for the mainframe."

In short, Unix is coasting down a price curve of 32-bit processors. Suddenly, it has the chance to be the heir to MS-DOS.

Whether it will manage to take the throne long reserved for OS/2 is still uncertain. Woo warns, therefore, to "stay tuned. We're in for interesting times." ❖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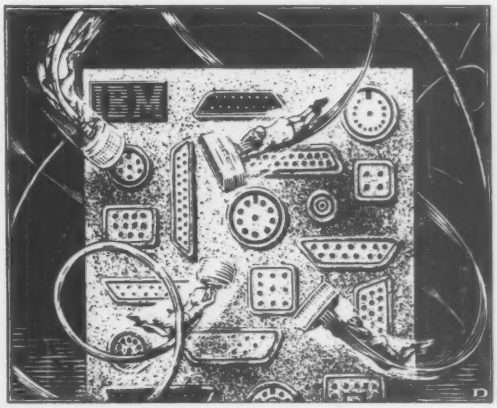
BY HELEN PIKE

Say good-bye to the Silverlake code name and hello to the AS/400 line. IBM's mid-range product has arrived. Salesmen are calling. Resellers are advertising. Consultants are phoning. Programmers are trying to figure out how to configure it.



BOB DAHM

The mid-range upgrade that combines the best of IBM's System/36 and 38 is yet another revolution in the wheel as IBM preps users for the arrival of its Systems Application Architecture (SAA). And so, like a continuous DOLOOP, the hoopla surrounding the arrival of SAA is never ending. AS/400 keeps the cycle humming.

"Silverlake is an instant in time," observes Peter Burris, editor of "The Gray Sheet," a 23-year-old computer industry newsletter published by International Data Corp., a market research company in Framingham, Mass. "It is an incidence of change in the information industry, much larger than the June announcement itself. SAA is the time capsule of change.

"SAA is the more seminal announcement," he adds. "It is the strategic direction. In four years, Silverlake processors will be replaced while SAA will just start becoming a reality."

Burris paints a picture of an AS/400 product set that could be "anything you want: a communication between hosts, a server for administration [or] for applications, a turnkey box. . . . It is the mid-range player in SAA."

As such, AS/400 is intended to renew IBM's trysting times with its customers — "the partnership," as Burris calls it. "IBM is trying to deliver more than just circuits. It's not magic. But it is mind-boggling to deliver it all at once."

Maybe that is why, long before the June debut, bits and bytes of information on the Silverlake project found their way outside the confines of IBM's Rochester, Minn., development plant, located next to a body of water actually called Silver Lake. Interviews conducted in May turned up scores of data processing industry participants swept up in speculation about the project's goings-on.

The System/36 and 38 community is vast. January 1988 estimates compiled by Computer Intelligence Corp. in La Jolla, Calif., reveal a staggering System/36 and 38 installed base in the U.S. of 95,843, which is made up of 83,188 System/36s and 12,655 System/38s. In comparison, Computer Intelligence estimates the IBM 4300's domestic installed base at 20,938, the IBM 370 at 240 and the IBM 9370 at 1,764.

Regardless of how the figures are divided, the eventual AS/400 installed base will form a powerful computing environment. Meshed are the 36's ease of programming, the 38's object-oriented architecture, up to 96M bytes of main memory, 27.2G bytes of direct access storage, interfaces for 32 communications lines and support for 200 active workstations. The power these numbers represent creates a potent customer group for software developers to woo with applications.

That's one of the realizations behind a massive software effort undertaken last year by Harris Data Service of Wisconsin, Inc. in Waukesha, Wis. Harris Data is designing applications for the System/38 "and beyond," according to David L. Sizemore, the company's research and development vice-president. To pull it off, the company has signed a nondisclosure agreement with IBM for certain technical details. Up until the AS/400's development, Harris Data had been primarily a System/36 software house, writing financial, distributor and job-costing applications. It has more than 3,500 customer sites.

"We can take advantage of the software technology of the the past five years and leapfrog other vendors without it costing us a lot," says Sizemore, who admits that Harris came late to the

Pike is *Computerworld Focus*'s senior writer.

System/38 revolution. Nor is Harris "forsaking the 36 marketplace. It's an excellent aftermarket to sell into for years to come."

Move to native applications

Sizemore predicts that in the aftereffects of AS/400 "there will be an evolution to more native applications. It will vary according to each user and how structured he is. The most effective way [to find and/or train developers] is to grow talent in-house, . . . to take System/36 coders and go through training to teach them how to work within the System/38 skeleton and become proficient."

He adds, "The software evolution will take between one and three years" for the AS/400 machines. In parallel to the System/36 and 38 migration to the new mid-range platform, an exodus of IBM 4300 mainframe users will take place, moving down onto the System/38 "to get more bang for their buck," Sizemore says.

Will these original mainframe users then go down further to AS/400's product family? Edward DiLorenzo, vice-president of MIS and project director at Whitbread North America, Inc. in Lake Success, N.Y., does not think so.

"I haven't seen anything from Silverlake that says I'm going to get more savings," DiLorenzo claims. For an estimated $1 million annual savings, DiLorenzo just finished a 4300-to-System/38 conversion for his company, the U.S. subsidiary of a British liquor distributor. Specifically, two 4341 Group 2 mainframes were moved to a System/38 Model 600 machine, eight programming jobs were halved, and the number of operators was reduced to five.

In all, DiLorenzo reduced his staff size from 21 people to 11 for a salary savings of $600,000; Whitbread's software savings, including maintenance, came to $265,000, he says.

"I don't know why anyone would want to migrate in the first year or two to Silverlake," he says, "because they may run it in native mode."

According to consultant David H. Andrews, president of ADM, Inc. in Cheshire, Conn., mainframe technical people appear to feel the most threatened by AS/400. But, he says, these people aren't going to go hungry if they pick up programming skills.

"Silverlake is triggering a shortage of System/36 and 38 programmers," explains Andrews, who is considered to be one of two AS/400 mavens recognized by the System/36 and 38 community. "With Silverlake, you can turn out a lot more applications. Although you might not hire more people to keep up with the backlog, you won't fire any."

AS/400's other acknowledged maven is Natalie Steele, president of Mid-Range Products, Inc., an IBM value-added reseller in Deerfield Beach, Fla.

"Although IBM's aim is to make it an easy box to use for a 36 shop, [AS/400] is not a box that will run itself," says Steele, who last fall began packaging Silverlake rumors into a monthly newsletter called "Hot Sheet," which she also uses to resell IBM products.

Recently the two-page flier began circulating as an insert in the monthly users' publication, *System/3X World*.

The System/36 and 38's code "won't go away," she adds. Therefore, programmers will be needed to manipulate code so there won't be any degradation of the program runtime in the RPG-II flat file format that will remain from the 36 in AS/400, according to Steele.

"Programmers are going to have to grow, to learn to code," she insists. Those who know RPG-II programming will have to learn some code in RPG-III in preparation for the changeover to the AS/400 mid-range line, Steele points out. "I would train my people to code in native.

"To remain static is your death," she says. "We are at the starting line of applications that are going to take off. We haven't seen anthing yet. . . . IBM is making a strong effort to support applications people because software drives hardware.

"IBM is exceedingly cognizant and in control more than it gets credit for," Steele observes. "I believe IBM is going to pull this one off."

Steele, who has not signed a nondisclosure agreement with IBM, points to all the news reports in the specialized publications and the slew of seminars around the country on Silverlake as evidence of a Big Blue hand moving behind the scenes. "IBM couldn't buy this kind of advertising," she says. And about her own role in it, she adds, "IBM could shut me down in a heartbeat. They choose not to. The information is controlled," adding, however, that "disinformation has also found its way into the marketplace."

Nonetheless, there are obvious business steps IBM is taking to encourage purchases of AS/400's mid-range family, Steele states. The corporation has built obsolescence into its System/36 and 38 lines, she says, and has begun increasing maintenance costs on the fraternal systems. "IBM is going to force the need for Silverlake computers. They already did it with the System/34 for the 38."

Steele will not speculate on how soon users will buy AS/400 systems, though she does say customers' initial purchases will have the same "motivation as the guy who's going to go down to the Porsche dealer and be the first to have a new model. Silverlake is the new red wagon. I have customers who have to be the first in their users group to have one."

> **Customers initially making AS/400 purchases will have the same "motivation as the guy who's going to go down to the Porsche dealer and be the first to have a new model. I have customers who have to be the first in their users group to have [the product].**
>
> NATALIE STEELE
> MID-RANGE PRODUCTS, INC.

Hot scoop

Ann Hedin is editor-in-chief of *System/3X World*, a Chicago-based controlled circulation magazine that goes to 41,000 sites throughout the U.S. and Canada. In July 1987, *System/3X World* broke the story of IBM's Silverlake project for the niche books, she claims.

Hedin has her own observations about the System/36 and 38 user-buyer community that is also her readership.

"There is no optimizing code for Silverlake at present," Hedin says. "They will either wait to buy or else build their own code if they want the machines."

In November 1987, at a Secaucus, N.J., seminar held by *System/3X World* in conjunction with Telex Corp., a separate panel devoted to Silverlake drew more than 300 people.

"Every last inch of breathing room was taken. There were as many software developers there as there were IBM customers," Hedin recalls. On their minds were two burning questions: what their future strategy should be and how they should manage software development in time to make the smoothest transition to the Silverlake machines.

By the time a similar seminar was held three months later in Los Angeles, the topic of Silverlake's technical identity had the attention of 1,000 programmers and systems analysts.

Hedin knows her readers well. Those who favor the System/36, she explains, will have to learn the System/38 relational data base concept, while those who like the System/38 will have to figure out the command structure of the 36.

Furthermore, System/34 and 36 system customers are likely to buy rather than build their own programs. Traditionally, System/34 and 36 machines have been set up in a company's accounting divisions; because of their basic configuration, the systems only require one or two operators, and programmers don't necessarily need formal training, she adds.

Conversely, the System/38 users "are a shop of techies, like the mainframe world. They are the intellectuals of computer programming. They are more likely to be involved in building, not buying," she says.

It is Hedin's observation that "those training the most vigorously [from the 36 and 38 camps] want to be [Silverlake] project managers. There will be fantastic career jobs when the system is available. The capacity of Silverlake is such that it will be employed in much larger shops than typical for 36 and 38 shops."

Also on the seminar circuit in preparation for the AS/400 product debut has been software-programmer-turned-executive Jeffrey J. Silden. Founder, president and chairman of a software company in Encino, Calif., that bears his name, Silden had given four seminars on "RPG-II Programming for the Future" during the six weeks before *Focus* caught up with him on May 5. Silden is also a technical editor and columnist for *News/34-38*, a monthly magazine published by The Duke Corp. in Loveland, Colo.

The AS/400 introduction will bring "not job reductions but more effective jobs," Silden claims. It will give DP the ability to off-load the applications backlog to the users and free it up to pursue more business objectives.

But, he adds, "I'd rather see a programmer get out of the business altogether than become a DP manager [as a result of AS/400], because it means he'll be trying to impose old ways of programming on a new system to program."

AS/400's software and hardware features are an "'enabling technology," says Silden, whose 6-year-old Silden Software company publishes operating systems utilities for the System/34 and 36 environments. In addition, the firm is a participant in IBM's account marketing assistance program and is an agent for installed systems. Silden, like Harris Data, signed a nondisclosure agreement with IBM. However, Silden is prompted to observe that the Silverlake project "was the worst-kept secret.

"IBM was forced into doing a pseudo-preannouncement because customers were running out of fuel on their System/36 and 38s," Silden says. "So it had to tell them, 'We're going to be there for you.' "

According to Silden, mid-range computing is used by small businesses — the Fortune 2,000 market. The gross bulk of sales is in the smaller market, he adds.

According to an IBM spokesman, that market, in part, is represented by 4.5 million U.S. business customers who would be potential first-time buyers of mid-range computers. "It seems to us there will be plenty of work for the programming community for years to come," says Robert Gilbert, a public relations specialist in IBM's Information Systems Group.

"Applications backlogs remain at a record high," Gilbert continues, and "product demand will go up as users think of new ways to customize better code."

Full house

With a house full of equipment and not looking to buy right away is Gene A. Gellman, information services director for Cyro Industries, an acrylic, sheet and molding company in Sanford, Maine, that is a partnership between American Cyanamid Co. in Wayne, N.J., and Roehm GmbH of West Germany. Gellman operates Cyro's DP needs with a staff of 23 — 17 technical staff members and six in operations and secretarial areas.

Cyro has gone from a System/3 Model 10 to a System/34 and then in 1981 to a System/38 Model 700 with 32M bytes of memory, adding a System/38 Model 600 with 16M bytes of memory in 1984. The company has 200 personal computers, mostly Personal Computer ATs, XTs, one RT Personal Computer, some Compaq Computer Corp. machines and a growing number of IBM Personal System/2s.

About 50% of the company's machines are tied together through a local-area network or gateway configuration, he explains.

Sometime in 1990 or 1991, the system will run out of communications steam, Gellman estimates, and he is looking ahead to remote communications and the implementation of X.25. "Right now, it's no major problem," he says.

In the 20 years that Gellman has been in the DP industry, nine of which he spent at Cyro, he says has seen "nothing but job evolution, from wiring boards to fourth-generation languages. An SQL front end won't do away with jobs," he says, referring to AS/400's relational capability. The new product family will, he explains, "push ad hoc daily routines down into the user community where they belong . . . and we can [then] use our technical people to solve architectural and applications problems.

"June won't be the final word, but it certainly is going to clarify SAA and how we participate in it," Gellman says. "From the programmers' point of view, with SAA, we need rules to evolve programs, regardless of the computer the program is developed on. It's a utopian goal that's 10 to 15 years away." ❖

products

TECH TALK

Consortia springing up to share development burden

By Michael Tucker

May's Comdex/Spring '88 in Atlanta proved, more than ever before, that software is expensive, hardware is cheap.

But just how completely the roles have switched — with software driving the price of computing and hardware almost going along for the ride — became clear at Comdex. There were big booths and expensive displays, but they tended to be the property of software companies or else they were run by hardware people talking about software. The IBM booth, for instance, was filled with stories about IBM and Microsoft's OS/2 — not hardware.

The little booths, meanwhile, were interesting, too. If you drifted to the edges of the show, where the small entrepreneurial operations had their shared displays and photocopied handouts, you found boards and systems.

This is where many clever, but underfunded, people go when they want to start up a business. They buy inexpensive chips, boards, cases and connectors and turn out subassemblies, add-in boards and complete computers.

Software switches roles with hardware in terms of expense and complexity.

This development can only be called astonishing. Less than five years ago, such projects would have been unthinkable. Software was perceived as the place you went when you had ambition but not capital. The most famous of the great fortunes of the computer industry — those of Lotus and Microsoft — arose from exactly that method.

Indeed, software development has been seen as so cheap and risky a thing that even today, most venture capitalists won't touch it. "They call it the 'dirty M word' — microcomputer software," one software publisher says.

But the sad truth is that now, quite the opposite is true. Software development is a business as complex and ponderous as heavy industry.

Nowhere is this fact more evident than in chip production. Increasingly, the chip makers live or die according to the availability of software for machines that use their processors. But establishing a library of software for any one device can be a bloody expensive business.

Thus it is that the chip makers have recently begun to resort to a tactic common to other high-cost industries: buyers' consortia. The chip makers are organizing groups of their customers — systems makers — to share the cost and risk of porting software to their platforms.

RISC maker, risk taker

Mips Computer Systems, Inc. in Sunnyvale, Calif., was one of the first vendors to attempt this approach. Mips makes sophisticated reduced instruction set computing (RISC)-based processors as well as subsystems and complete systems based on those chips.

Early this year, Mips announced that it was forming Synthesis Software Solutions, Inc., also to be based in Sunnyvale. Synthesis is a classic buyers' club, composed of various Mips customers.

Synthesis will search out software that will be useful to its members' customers and then arrange joint ventures to pay for porting (or, in some cases, development) of that software. If, for example, a particular program would be a valuable asset to three or four member companies, those three or four might band together to share the costs.

Synthesis is an ambitious effort, as is Mips itself. Both have to be, because Mips is a relative newcomer to the processor business, and it must aggressively court applications. Yet the consortium model has its uses elsewhere. It can provide a method of sharing the software burden even among the most established of vendors. Consider Motorola.

During the late 1970s and early 1980s, Motorola processors controlled major chunks of the market, particularly for Unix-based systems. For example, both Apollo Computer and

Continued on page 35

Tucker is *Computerworld Focus*'s features editor.

PRODUCT CLOSE-UP

Reengineering line bows

As any MIS officer can testify, a vastly disproportionate amount of programmers' time and effort is spent on the maintenance and upgrading of code. Now, Cambridge, Mass.-based Bachman Information Systems, Inc. is bringing computer-aided software engineering (CASE) techniques to the problem of reengineering code.

Bachman has unveiled a series of products that allows MIS to dump aging code into a computer on one end and get exact definitions of the code's status on the other. While this doesn't make Bachman's products unique (there are other similar tools available), they are said to be among the broadest sets of such offerings on the market.

The Bachman/Reengineering Product Set consists of five interlinking CASE offerings: the Bachman/Data Analyst, the Bachman/Database Administrator (for Cullinet Software, Inc.'s IDMS), the Bachman/Database Adminstrator (for IBM DB2), the Bachman/File Adminstrator and the Bachman/Workstation Manager, which is underlying software that allows the other tools to run on Intel Corp. 80386-based personal computers.

AT&T's AOE push underscores its Comdex rollouts. Story, page 38.

The offerings can be used as PC-based CASE for the development of code. In addition, code that is developed using these products or even older programs that were hand-coded can now be carefully managed. The Bachman products will reportedly capture the file and source code of the applications and place

Continued on page 37

BLUE BEAT

Ruse or news?

Brian Jeffery

IBM's Systems Application Architecture (SAA) is now more than a year old. It was in March 1987 that IBM said it would introduce SAA, first described as "a collection of protocols, interfaces and standards . . . that will enhance the consistency of IBM software products."

Since then, most of us have become familiar with the Common Programming Interface, the Common User Interface and the like. But the fact is that nobody really understands SAA, although everyone pretends to.

Part of the problem is that, in its initial form, the SAA specification is incomplete. Confusion has been added by IBM's promotional tactics, which treat SAA as if it were some kind of patent medicine that will magically erase incompatibilities, immediately solve all outstanding software problems and, in some mysterious manner, cause IBM software products written for MVS/XA to run on the System/36 and vice versa.

SAA has been one of the most devastatingly successful cases of the emperor's new clothes that the computer industry has seen.

It has slowed IBM's competitors, impressed end users and helped bring the third-party software community into line. And all this activity was started by a 40-page booklet that lists a bunch of commands but does not define or describe SAA, does not indicate how it will be implemented and does not offer any practical advice or guidance whatsoever. That such a thing could be taken seriously by this industry is, when one thinks

Continued on page 38

Two ways to expand your VM System.

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Single System Image (SSI) from VM/CMS	VM Inter-System Facilities (ISF) from IBM
You can use any version of VM/SP or VM/HPO in an SSI complex.	IBM's ISF requires that you use HPO.
You can use any processors in Group 10, 20, 30, or 40 in an SSI complex.	IBM's ISF does not support Group 10 and 20 processors. In Group 30, ISF only supports 4381's with 16 megabytes or more, and 3083's. In Group 40, ISF does not support the 3081 D16 processor.
An SSI complex supports up to 33 processors.	IBM's ISF is limited to four CPUs.
SSI dynamically switches virtual machines from one processor to another to satisfy user requirements. This means a user's terminal and virtual machine can be on different CPUs. As a result, duplicate software licensing and maintenance charges can be reduced or eliminated.	IBM's ISF offers no switching capability.
SSI balances the user load automatically.	IBM's ISF doesn't do load balancing.
You can use IUCV and VMCF to communicate between programs across processor boundaries in an SSI complex.	With IBM's ISF, you can't use IUCV and VMCF across processor boundaries.
SSI supports FBA and Count/Key/Data devices.	IBM's ISF inter-system link and spool facilities do not support FBA devices.
SSI doesn't require extended storage support.	IBM's ISF does.
SSI has been available since 1980.	IBM's ISF has been available since last year.

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Circle Reader Service Number 18

Tech Talk

Continued from page 33

Sun Microsystems based their workstations on Motorola processors.

But in the mid-1980s, Motorola was caught between two converging trends. At the low end, its market was being taken over by inexpensive Intel 80386-based systems. And at the same time, its upper end was threatened by the defections of top customers who had tired of waiting for a RISC-based version of the Motorola chips. (When Apollo unveiled its chip architecture in its Prism line of products, Apollo said that if it had had access to a Motorola RISC chip, it would not have bothered developing its own.)

Actually, Intel has had its share of problems, too. By 1987, all the processor vendors were confronted with a revolution. Silicon chip development tools had become sufficiently advanced that almost any good computer engineering firm could develop processors. Moreover, the Intel and Motorola processor architectures were not developing fast enough.

"The vendors knew where they wanted to be in 1990," says Gig Graham, director of software services for the Gartner Group, Inc. in Stamford, Conn. "And it was clear that neither Intel nor Motorola could take them there."

By 1988, Motorola had its RISC chip, the 88000, on the market. But the presence of a chip on the market does not make it success. So in March, Motorola announced 88Open, a consortium of early adopters of the 88000 chip.

The group is far less ambitious than Synthesis. It will not, for instance, attempt to develop software. It is a nonprofit organization. According to 88Open's acting director, Roger Cady, who is also president of Arcadia, a consulting firm in Stratham, N.H., "We want to be a focal point where the members can say they need this or that software and we can go out and arrange for the port."

A matter of cost

But 88Open is similar to Synthesis in that it is meant to be a device to share costs. "It would be hard for any one member to plunk down $5 million for a port," Cady explains. "But maybe, if there are 10 companies, they'd each chip in $500,000 to get it done."

That's a logic sure not to escape other interested observers. There are already rumors that other chip makers are looking into similar consortia. And perhaps large consumers of software will get into the act as well. Users groups, trade associations and even the MIS shops of larger corporations can profit from the buyers' group approach.

But the real meaning of the consortia is in the economics they represent. These groups are the tacit acceptance of the primacy of software costs over hardware ones. Doubtless, there will be other, similar mechanisms to share software costs in the near future.

Could the industry ever go back to the way it was before? Could all these trends be cyclical in nature so that, at some time in the future, hardware will again be costly and software cheap?

Perhaps. Two recent developments suggest that it is possible. The first of these is the appearance of standard virtual machines — programs that fall somewhere between system software and applications and that can support applications. A classic example of such software is Apple's Hypercard.

There have been reports lately that Hypercard hasn't caught on in the corporate world. But by creating an industry devoted to inexpensive stackware, oftentimes developed by nonprogrammers, Hypercard has demostrated that not all software costs may be eternal.

The second major development, meanwhile, is the spread of the same silicon design tools that have been putting pressure on Motorola and other semiconductor vendors.

The processor houses, Motorola and Intel in particular, have been successful partly because they could and did devote all their resources to processor development (at a time when the computer vendors could not do so) and still develop complete systems. By making the same processors cheaply available to everybody, large and small alike, they made it possible for small start-ups — like Sun, which was small once — to successfully compete against giants.

Now, however, the computer vendors have access to radically new chip processor design and fabrication tools. They can easily devote a fraction of their staff to very large-scale integration design and still have lots of staff to spare for everything from marketing to assembly. This is exactly what Sun has done with its Scalable Processor Architecture chip.

Indeed, it also seems to be what IBM is doing with the upper levels of its Personal System/2 line. The processor is still very much an Intel 80386, but more and more of the other chips in the system are IBM born and bred.

Perhaps, then, we will eventually enter a period in which the large computer houses alone will have the resources to develop hardware. Smaller companies will simply not be able to afford the silicon design tools available to major companies — at least, not until those tools come down in price.

And, then, who can say? Maybe the cycle will start all over again.

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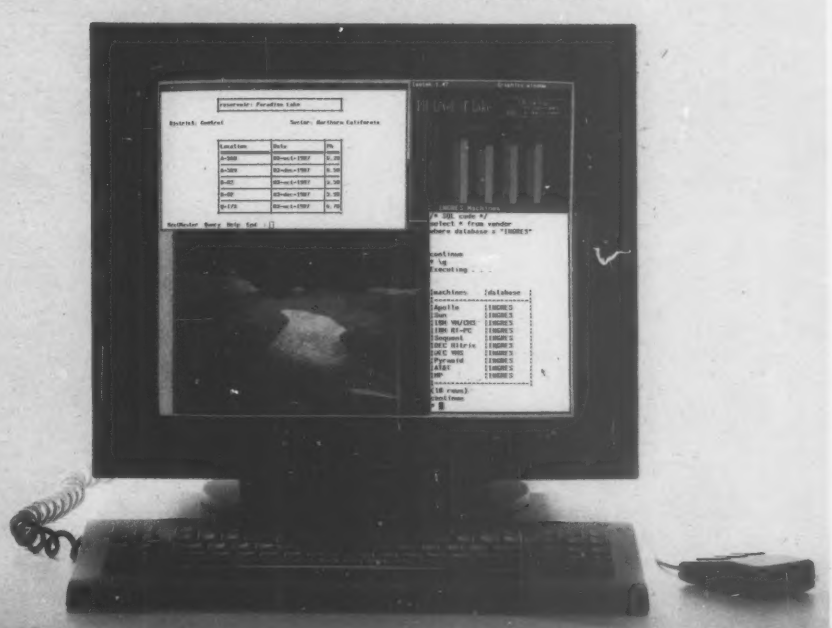

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Circle Reader Service Number 19

PRODUCT CHECKLIST

The drive to put software products on IBM and Microsoft Corp.'s OS/2 platforms recently took an interesting turn. **Logitech, Inc.** announced **Modula-OS/2**, said to be the first version of the Modula programming language for IBM Personal System/2-class machines.

Modula is a highly modular and object-oriented programming language developed in the early 1980s. However, it never caught on in the U.S., in part because it was overshadowed by objective versions of C, such as C++, which AT&T backs.

But now, there will be Modula for the PS/2, which might have some advantages. For instance, OS/2's major rival, Unix, is written in C and is supposed to be rewritten in C++ by Sun Microsystems, Inc. and AT&T. Perhaps Modula could be marketed as the OS/2 alternative to Unix's C.

Modula-OS/2 costs $349.

Logitech, 6505 Kaiser Drive, Fremont, Calif. 94555.

Circle Reader Service Number 126

Expert systems seem to be taking aim at mainframes and at MIS professionals. In particular, they are being marketed as programmer's assistants in the care and feeding of large systems.

Applied Data Research, Inc. (ADR), for instance, is now shipping **Mindover MVS**, said to be a complete expert system for IBM MVS and MVS/XA performance management. Running on an IBM Personal Computer or Personal System/2 machine, Mindover MVS operates as a kind of expert-in-a-can. Less experienced operators can query it or use simple menus to manage the mainframe more effectively. In particular, ADR said, it can help maximize throughput, ensure minimal respose time and correct resource overutilization.

Mindover MVS represents a first in the application of artificial intelligence to the problems of mainframe management. In an age in which trained MIS personnel are hard to come by, an expert system that enables the MIS department to stretch its resources will be welcome.

Also, Mindover MVS is a key part of ADR's larger strategy. The company now seems to be shifting from an overdependence on its data base products to new offerings.

A permanent license for Mindover MVS costs $42,000.

ADR, Route 206 and Orchard Road, CN-8, Princeton, N.J. 08543.

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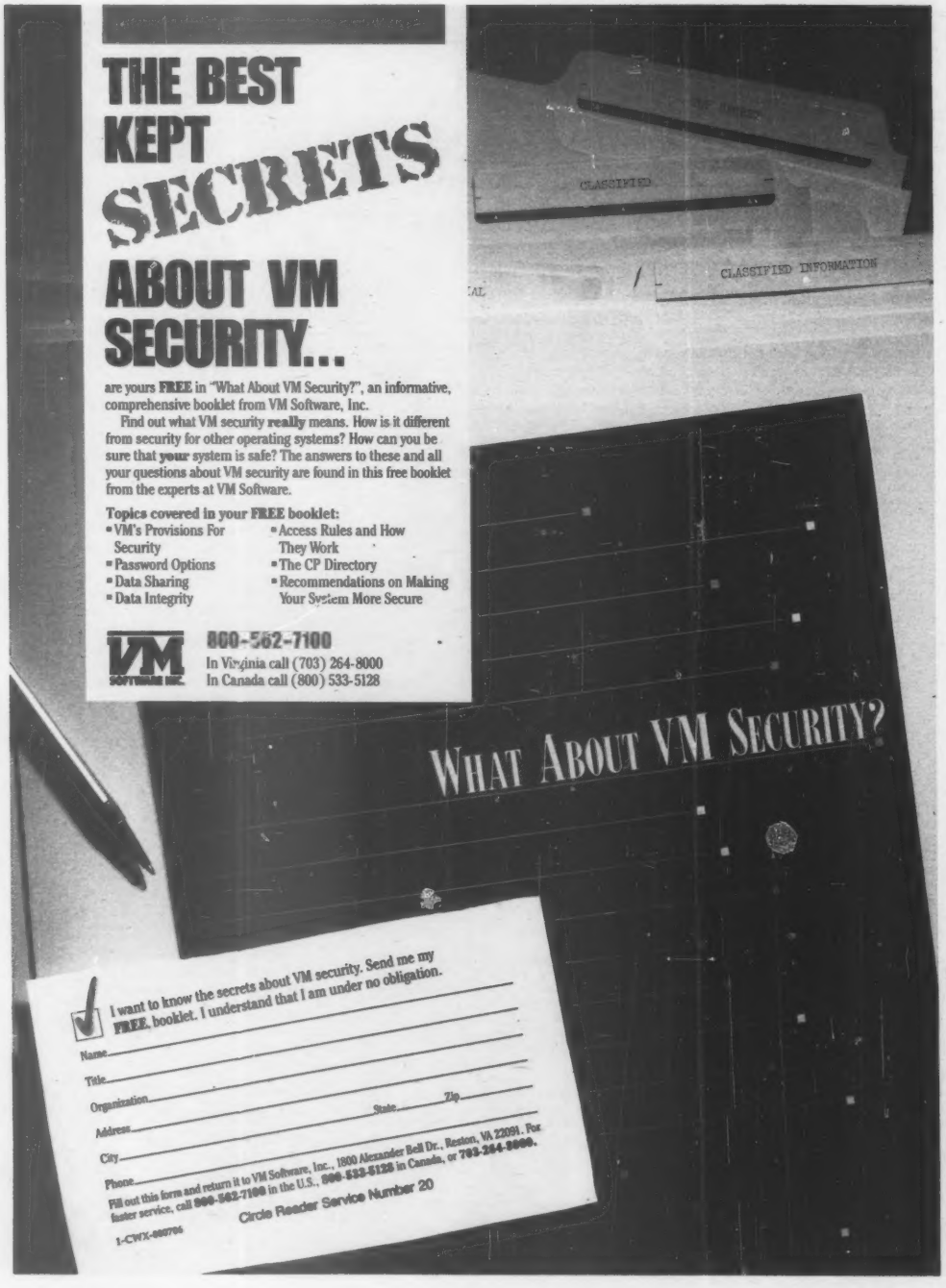
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Manager

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maybe they should question their design. Otherwise, DBMSs will be neither flexible, efficient nor low risk. Is data really going to be shared? Is security justified by the effort? Is standardization really required? MIS shouldn't make the easy but erroneous assumption that in the future all data will meld together.

• **Flat files or simple technologies work just fine in many cases.** There are alternatives, like IBM's VSAM, that most programmers can use easily and directly that will make any segregated application simpler, more efficient, more reliable and more understandable.

Granted, this approach may require specialized instructions for protection, more fundamental involvement for programming changes and some other concessions. But these are things that MIS can do and do well.

Just so there is no misunderstanding, let me be very clear that I am not opposed to today's data base technology. In many areas, it is essential. I am saying that MIS managers should not let chauvinistic devotion force them to use it where it does not make sense. Their ultimate obligation for performance, flexibility and manageability should force them to tailor their uses of technology to fundamental company needs.

Object-oriented text management debuts

One of the hardest problems in modern computing is the management of large chunks of text, particularly text search and retrieval.

A number of firms have tried to address this situation. One of the more popular methods vendors adopt is a technique based on Boolean methods. The trouble is that Boolean methods work well with data structured in a way that is easily digestible by machines, such as tables or numerical information. Text, unfortunately, is not of that sort.

Some firms have tried to compensate with brute force. Thinking Machines Corp. in Cambridge, Mass., for instance, markets its multiprocessing CM2 this way. Essentially, each of the CM2's thousands of processors searches a different part of the text data base.

This process is effective, but the average CM2 costs about $1 million. Most MIS managers in need of full text search capabilities seek a less expensive path. The goal has been a technique that can give conventional machines the power to do brute-force-style searches without brute-force-style processing.

Verity, Inc. in Mountain View, Calif., has rolled out Topic, a product that attempts to do exactly that via sophisticated programming techniques. Topic applies artificial intelligence techniques and object-oriented programming to the problem of text management.

Topic has conventional — that is, Boolean — text retrieval capabilities. But in addition, it allows the user to create objects that contain rules about specific subjects. An object is then called a "topic." The product supplies a graphical interface that allows the user to manipulate topics (the data objects).

Topics can be interrelated and stacked up into libraries. A user can search Topic with precomposed topics from the library or combine topics into new ones tailored for particular needs.

Moreover, Topic contains a number of mechanisms that can modify the way the information is displayed. For example, it can calculate the relevance of any document to the topic at hand. Things it considers relevant are presented first, with less relevant data presented later.

The product also has an alarm system so that if certain subjects are specified as being important, Topic will alert the user to their appearance in the data base. Thus, if the system is adding data in real time — such as from a news wire — it will bring any new additions to the user's attention.

Topic runs on Unix, Digital Equipment Corp. VMS and Microsoft Corp. MS-DOS machines. It can be a networked system that runs on a server. Workstations running the Topic node software can link up to a larger Topic system running on, for example, a DEC VAX or a multiuser Unix system.

A complete Topic system, including both the data base and network server, costs $15,000. The data base alone is priced at $8,000. The server alone is $8,000. An MS-DOS node costs $695, and a Unix node is priced at $2,500. A multiuser version running on VMS or Unix costs $39,000. — MICHAEL TUCKER

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Bachman

Continued from page 33

them into a proprietary design data base. This data can then be called and used whenever the code needs to be upgraded or modified.

Thus, the Bachman/Data Analyst, which costs $25,000 running on a 386-based IBM Personal Computer or compatible, gives the user graphical tools and expert system-style support while developing or maintaining the basic information models that are the underpinnings of most MIS applications.

According to Bachman, the Database Administrator products, each of which also sells for $25,000, provide similar graphical representations for DB2 and IDMS. The File Adminstrator, which costs $2,000, can be used to manage, create and display VSAM and flat files.

The Workstation Manager, priced at $25,000, provides the foundation for all of the above offerings. — MICHAEL TUCKER

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AT&T's product barrage

Comdex rollouts bound together by work group concept

At Comdex/Spring '88 in Atlanta, AT&T announced no less than 50 additions and enhancements to its line of computer offerings. These products ranged from network software to the 3B2/700, a $69,000 mid-range computer that can support up to 40 users.

The press kit for all these announcements was 72 pages long, counting the price list in the second appendix. What was most interesting about those 72 pages was the fact that work group computing figured in as a major direction for AT&T.

Virtually all the announcements, in some fashion, were tagged to the idea that office labor could and should consist of the combined effort of small- to departmental-size groups. Even the AT&T entry-level machine, an Intel Corp. 8086-based IBM Personal Computer XT-compatible priced at $1,400, was called the AT&T 6300 Workgroup System.

Networking at forefront

In fact, all the hardware AT&T displayed at the show appeared to be not so much stand-alone systems as end points for AT&T's networking products. Clearly, communications and networking are very much at the forefront of what the company wants to do with computers.

Another reason AT&T's announcements were interesting had to do with its Applications Operating Environment (AOE). This is a relatively new acronym that AT&T is starting to use at shows and industry gatherings.

AOE is defined by a company spokesman as the entire "set of operating system and systems software interfaces . . . [that] . . . specifies the software interfaces of a computing environment without restricting users to a specific architecture."

As yet, AOE is a bit vague. But, according to AT&T, it will be composed of operating systems, development tools, data management tools, user interfaces and data networking standards. In operating systems, for instance, AT&T said, "AOE brings together the major standard operating systems: Unix System V and Microsoft Corp. MS-DOS and its derivatives, such as IBM's OS/2. In an AOE, these operating systems are complementary, not competitive."

That kind of program is extremely ambitious. In effect, it is akin to IBM's Systems Application Architecture strategy but one based apparently on Unix and one that will apparently reach out to other vendors. — MICHAEL TUCKER

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Blue Beat

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about it, ridiculous.

Interestingly, IBM doesn't seem to take SAA that seriously itself. During 1987, the company presented Earl Wheeler, IBM corporate vice-president of programming, as IBM's SAA supremo. Wheeler, the industry was told, was to head up a megadevelopment organization with 24 worldwide software laboratories, thousand of programmers, billions of dollars and four top vice-presidents, one for each element of SAA.

To anyone who knows IBM's organization, this setup was a transparent hoax. Corporate vice-president posts in IBM are considered by some to be largely insignificant jobs whose occupants are mainly engaged in administrative tasks that support the real IBM power bases — the operating units. Wheeler had only dotted-line reports, and his four top VPs were not even full-time; they chaired fuzzily defined committees while continuing to act in other capacities.

Now you see it, now you don't

Then, in April 1988, this structure disappeared off the IBM organizational chart altogether. Wheeler was named to head the new IBM Programming Systems business unit, which included the IBM Santa Teresa and Cary laboratories. The unit is responsible for IBM's DB2, IMS and other data base management systems, for some MVS subsystems programming and for IBM application development tools. It has about 3,000 people and — the point can be easily missed — no control over the actions of the other IBM product business units.

Wheeler took virtually all of the IBM headquarters SAA staff with him to his new position. (Incidentally, the IBM headquarters SAA staff could all fit comfortably into the back of a minibus.) The four top VPs were no longer in evidence. Wheeler was replaced at corporate by Peter Schneider, former development chief in the Enterprise Systems Unit, and the headquarters SAA group evaporated.

As if that wasn't enough, IBM then rather quietly changed SAA. In a little-noticed announcement in October 1987, IBM started talking about a new Communications Programming Interface. This interface was a routine LU6.2 implementation that enabled one to write coprocessing applications that reportedly would link IBM Personal System/2s with MVS and VM host environments. LU6.2, IBM indicated, was out of Common Communications Support and in the Common Programming Interface.

This move helps explain what SAA is all about. It has less to do with getting System/36s and 38s to talk to 370 machines or VSE to talk to MVS than it does with integrating the Personal Computer base into IBM's wonderful world of mainframe coprocessing.

It was somewhat disconcerting to find that standards could leap from one SAA category to another practically overnight and even more unsettling to find that IBM's revised definition of SAA included only OS/2 Extended Edition.

There was no mention of OS/2 in its Standard Edition form. Indeed, during the last few months, IBM's presentations have been subtly shifting ground to note that OS/2 Extended Edition is the way to go, not OS/2.

SAA is changing in other ways. IBM is

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ISDN: Understanding the Technical Requirements. New York, July 12-13 — Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521.

Second International CASE Workshop. Cambridge, Mass., July 12-15 — Contact: Pamela Meyer, Index Technology Corp., One Main St., Cambridge Mass. 02142.

Networking in a CIM Environment: Connectivity, Technology and Trends. Dallas, July 13-15 — Contact: Network Career Advancement Institute, 202 Fashion Lane #113, Tustin, Calif. 92680.

July 17-23

IBM's Systems Application Architecture. Boston, July 18-19 — Contact: Gen2 Ventures, Suite D-5, 12930 Saratoga Ave., Saratoga, Calif. 95070. Also being held Aug. 18-19 in Santa Clara, Calif.

X.25 Packet Data Systems. Chicago, July 18-19 — Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521.

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Bridging the Gap Between Users and Developers. Boston, July 20-22 — Contact: Digital Consulting, Inc., 6 Windsor St., Andover, Mass. 01810. Also being held Sept. 14-16 in Chicago.

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OS/2 and SAA. Cambridge, Mass., July 25-26 — Contact: Information Engineering Institute, Suite 207, 5119-A Leesburg Pike, Falls Church, Va. 22041.

SNA: A Decision Makers' Overview. Boston, July 25-26 — Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521.

Blue Beat

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now saying that some form of RPG will be part of SAA, as will PL/I. AIX, IBM's Unix offering, is or is not SAA-compatible, depending on which IBM insider you talk to. And SAA will either allow applications to be ported from one IBM system to another or, according to an IBM observation in October of last year, will make it "easier" to port applications.

Confusing, particularly because the industry still doesn't know exactly what is involved in being a part of SAA. Can someone talk of something being "supported under SAA" or "SAA compatible?" Who knows?

After more than a year of SAA brouhaha, IBM announced its Enterprise Systems Architecture (ESA) this year with scarcely a reference to SAA, beyond a terse comment that MVS/ESA would be the base for future SAA enhancements for MVS systems.

Even DB2 Version 2, announced in April with much fanfare, merited only the brief and buried statement that "DB2 Version 2 continues support of IBM's Systems Application Architecture as documented in SAA Common Programming Interface Database Reference (SC26-4248)." Not exactly a ringing declaration.

Behind the smoke screen, something serious is going on at IBM. The company is changing horses in what may be its most significant architectural commitment since the 360 in the 1960s.

At the mainframe level, this involves ESA. IBM has shown half of this to date: MVS/ESA is an interesting repackaging of the core MVS environment with DB2, TSO/E, IMS-DC, CICS/MVS and the Data Facility product family into a data management complex. This moves MVS/XA into the background as a functionally specialized large systems data manager.

The other half of ESA (call it, for want of a better name, VM/ESA) will off-load 370 applications processing, handle networking and resource management and look after multiple 3090 complexes. In addition, the coprocessing architecture will emerge to integrate PCs (or rather, as IBM now likes to call them, intelligent workstations), multiple-level Token-Ring offerings, telecommunications systems, the various flavors of IBM mid-range and small systems and just about everything else.

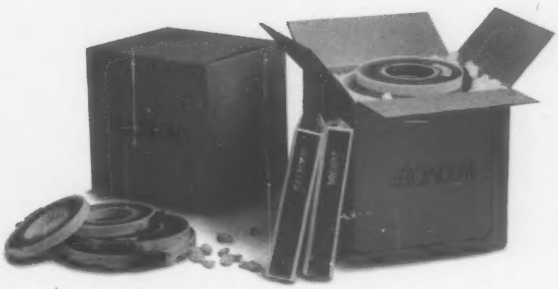
Not the SAA I know

One of the more intriguing aspects of this process is that, in effect, IBM is creating an architectural continuum stretching from the lowliest PS/2 to the largest 3090. At least, that's what it will look like when the process is complete, which should be sometime in the 1991 to 1994 time frame. This offering, however, will not be SAA, certainly not in the form that IBM has described so far.

Now that Wheeler has moved on and the IBM SAA organization has gone, the task of coordinating this process falls to Schneider, IBM's new corporate vice-president of programming.

Perhaps someone in IBM has a subtle sense of humor. Schneider is a German name, and it means "tailor." Who better, after all, to make a new suit of clothes for the emperor?

Jeffery is managing director of the International Technology Group, a management consulting and market research firm in Los Altos, Calif.



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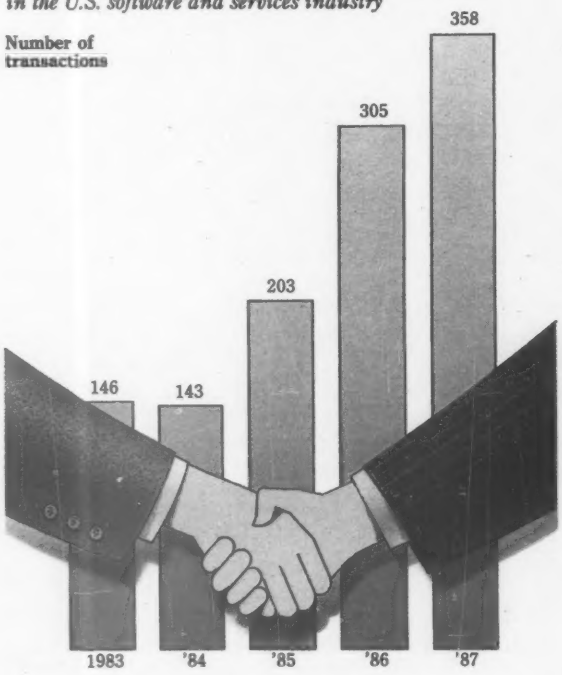
Mix 'n match

Historical growth in mergers and acquisitions in the U.S. software and services industry



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OF INTEREST

"Sun likes to think of itself as a technical company, but really, it is a marketing engine. They are, in effect, beauticians. They were better able to dress up the old girl [Unix]. They were able to take the ugly child and make her a beautiful woman."

GIG GRAHAM
GARTNER GROUP, INC.

See story page 27

next issue

In August, *Computerworld Focus* examines departmental computing. Although Digital claims it "has it now," we'll profile this mid-range vendor to see what it offers for the future. Learn how the Unix upheaval is affecting departmental systems and whether workstations and MIS can coexist and prosper together. We'll also have a progress report on work group computing. Is it worth the effort? Rounding out our departmental coverage is a Special Section on systems integration in a multivendor world.

A Metaphor for success

Michael D. Millikin

In April, IBM announced a strategic partnership with Metaphor Computer Systems, Inc., a provider of an object-oriented workstation-based front end that enables end-user programming with access to corporate data bases. The alliance could have a profound impact on the evolution of the industry.

The specifics of the deal are that Metaphor will port its workstation software environment to IBM's Personal System/2-OS/2 platform, the two companies will share technology bidirectionally and IBM will take a small equity position in Metaphor as a show of support and partnership.

Although the impetus for the deal came from a customer who wanted Metaphor functionality on a PS/2 platform, IBM is pretty pumped up about the broader potential.

Two things could come from this deal. First, IBM could use Metaphor as a specialty offering. The second, more tantalizing possibility is that IBM could push the Metaphor technology down into the operating system platform of OS/2, using Metaphor as the basis for the next-generation object-oriented operating environment.

If IBM were to push the Metaphor technology into OS/2, it would have a jump on the migration to complete object orientation. It would also, however, create a fundamental incompatibility with the existing library of OS/2 applications.

In its first implementation, the Metaphor kernel reportedly will support data retrieval calls out to standard OS/2 applications but will not support the launching of those applications within the Metaphor environment. Users will have to operate in two discrete environments.

The bottom line is that straight Presentation Manager applications cannot run in a Metaphor environment as currently planned.

Hewlett-Packard recognized this problem when it created its New Wave. Rather than designing a pure object-oriented environment, HP structured New Wave to support non-New Wave applications as well. On the other hand, an application written or modified to exploit New Wave's Object Management Facility has an object orientation similar to that of Metaphor.

The question thus becomes: Can IBM implement Metaphor technology in such a way as not to disrupt completely the current and evolving base of applications (a move comparable with sticking the barrel of a shotgun in your mouth and pulling the trigger)?

Although tempting, a unilateral move incorporating Metaphor into an extended Extended Edition of OS/2 would split the personal computer world to IBM's ultimate detriment. Sensibly, IBM wants to include Microsoft in any broad incorporation of Metaphor technology. Let's hope IBM sticks to that plan and doesn't try to seek competitive distinction by diverging from support for the rest of the OS/2 application world.

Millikin is vice-president and senior analyst with Patricia Seybold's Office Computing Group in Boston.

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